

## 3.11 Science Data Distribution Activities

### 3.11.1 Network Data Distribution (Pull) Scenario (Nominal)

#### 3.11.1.1 Scenario Description

This scenario describes the process and affected components when data is requested for distribution via an external network. The mechanism for distribution is a File Transfer Protocol (ftp). For data pull operations, data will be staged to the appropriate Pull Volume and a notification will be sent to the requestor either via an Active Client or via E-mail. The notification will provide the requestor with the necessary path and file naming information to retrieve the requested data from the associated Pull Volume. Data will remain on the associated Pull Volume for a specific time interval established via DAAC Policy.

A user connects to the system and performs a search for a specific data product. When the system notifies the user that the product is found, the user requests an ftp pull of that data. The data is retrieved from the archive and placed on the Data Server Pull Volume. The user is notified of the data's readiness and now has a DAAC-set period of time to retrieve the data. A nominal network pull distribution scenario is described in Table 3.10.1.6-1.

#### 3.11.1.2 Frequency

There is no routine schedule for network (pull) distribution. As per Project direction, we are assuming 1/2 of all distribution is handled via electronic distribution. For the purposes of this discussion we will assume the average request size is 5 GB. We will also assume that 75% of electronic distributions are Pull rather than Push. Based on these assumptions the following is the number of electronic Pull distribution requests that will be seen at each DAAC per day. (Note that electronic Pull is a fully automated function.) Readers interested in the volumes associated with these data granules are referred to the ECS IDR Technical Baseline.

DAAC	Number of Electronic Pull Requests
GSFC	61
EDC	66
JPL	2
LaRC	25
ORNL	5
ASF	11
NSIDC	1

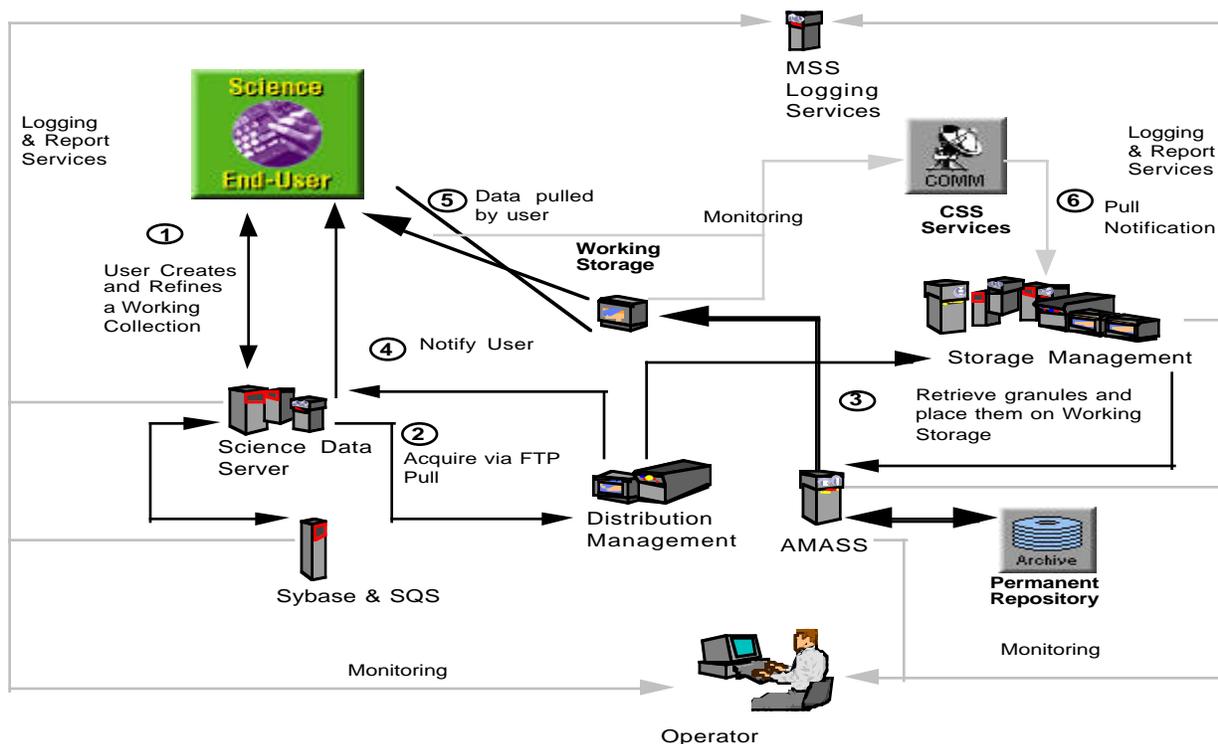
#### 3.11.1.3 Assumptions

This scenario assumes operator confirmation of staging delete is set to off. All hardware and software components are fully functional and the Subsystem load is medium. The Pull Volume is

less than 50% full and the request is within the parameters of a normal request (i.e., does not exceed physical size of number of files per request watermarks.)

### 3.11.1.4 Components

This scenario involves many components of the Data Server. These included the Working Storage HWCI, the Network Pull Volume, Science Data Server, MD CSC (Sybase), Storage Management, FMS CSC (AMASS), the Data Repository HWCI, Distribution Management, the external network, and MSS Logging & Report Services. Figure 3.11.1.4-1 represents the components involved in data distribution functions.



**Figure 3.11.1.4-1. Network Data Distribution (Pull) Scenario (Nominal) Components**

### 3.11.1.5 Preconditions

None

### 3.11.1.6 Detailed Steps of the Process

Table 3.11.1.6-1 represents the details of this scenario. The times and duration given are approximate.

**Table 3.11.1.6-1. Network Data Distribution (Pull) Scenario (Nominal) Process (1 of 3)**

Step	Est <sup>1</sup> Time	Operator/User	System	Purpose	Figure
1	1 - 5 min	A user establishes a client session to a Data Server and creates a working collection of data.	The Data Server assigns a session ID and logs (via MSS Logging Services) the initiation of the session. The Data Server logs and queues the search request sent by the user to create a working collection and searches the Metadata Database in accordance with the user's indicated search attributes when the request is reached in the request queue. Identified granules are returned to the user's working collection.	Establish a Data Server session and initiate a search.	
2	1 - x min <sup>2</sup>	The user refines the contents of the working collection to specific granules of high interest. The user invokes an acquire (via ftp pull) service to obtain the high interest granules. The operator can track progress of a request and review any errors recorded by using either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu or can view actual request status's via the Distribution Management Component's <i>Requests</i> Screen.	The Data Server logs (via MSS Logging Services) and queues subsequent search requests to identify high interest granules and searches the Metadata Database in accordance with the user's refined search attributes when the request is reached in the request queue. The user's working collection is updated with the results of each subsequent search. Distribution Management logs (via MSS Logging Services) the Acquire Via ftp Pull Request and sends a Data Retrieval Request to Storage Management listing the granules of high interest to be retrieved and placed on the Pull Volume.	Refine search criteria to high interest data and acquire this data.	3.11.1.6-1 3.11.1.6-2

<sup>1</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

<sup>2</sup>The time required to refine the contents of a working collection is a function of the data server load and the size and complexity of a user's query.

Step	Est <sup>3</sup> Time	Operator/User	System	Purpose	Figure
3	1 - x min <sup>4</sup>	The operator can review progress for any request via either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu or via the Storage Management Component's <i>Logs &amp; Reports (MSS)</i> submenu available on the <i>Other Screens</i> pull down menu.	Storage management logs (via MSS Logging Services) and queues the Data Retrieval Request. When the request is reached in the request queue, Storage Management requests the appropriate granules be retrieved from the archive via the Archive Management OTS Product. The granules are placed on the Working Storage and transferred to the Pull Volume, the reference count for each file in those granules is incremented and a Data Retrieval Request completed message is logged and sent to Distribution Management .	Retrieve the appropriate granules and place them on the user pull volume.	3.11.1.6-1 3.11.1.6-3
4	1 - 3 min	The operator may view Pull Area Utilization data via the Storage Management Component's <i>Pull Area Utilization</i> Screen.	Distribution Management extracts the file names and path names associated with the high interest granules. A Retrieval Complete Notification is created which includes file and path names. This notification is sent to the requesting user's client or via email to the user if no client is active.	Notify user that data is available.	3.11.1.6-4

<sup>3</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

<sup>4</sup>The time required to retrieve granules from the permanent archive is directly related to the number and relative sizes of the files composing the granules of interest.

5	1 - 3 min <sup>5</sup>	The users retrieves the requested data from the DAAC's pull volume.	CSS Subsystem detects and logs (via MSS Logging Services) that an authorized user has accessed specific files on the pull volume. CSS provides a Pull Volume Access Notification to Storage Management which enumerates the path names and files retrieved by an associated user ID.	User pulls data. ECS detects the pull and arranges volume cleanup.	
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<sup>5</sup>This does not include the time necessary for the user to pull the requested data.

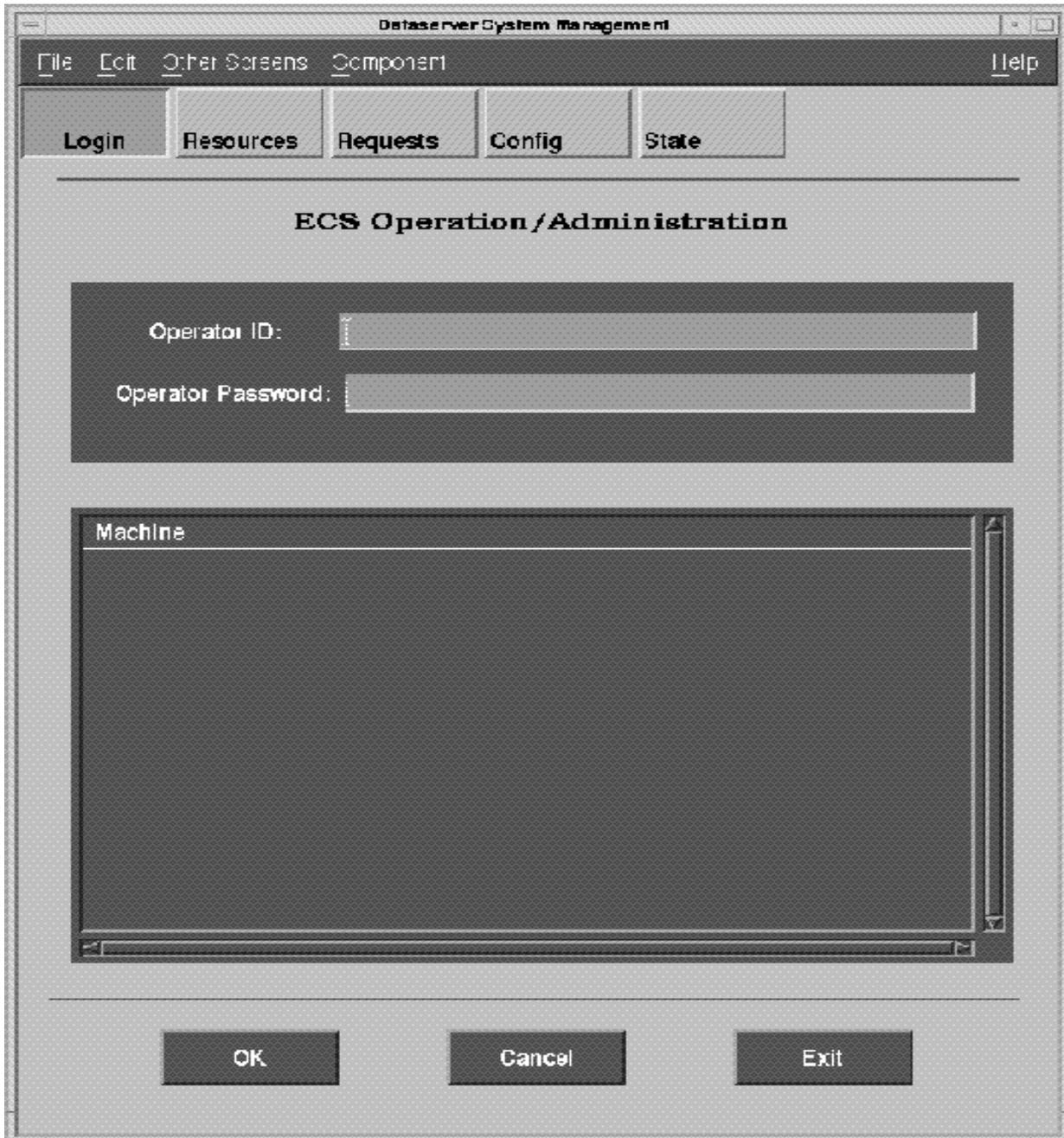
Step	Est <sup>6</sup> Time	Operator/User	System	Purpose	Figure
6	1 - 3 min	The operator can verify request completion via either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu, the Storage Management Component's <i>Logs &amp; Reports (MSS)</i> submenu available on the <i>Other Screens</i> pull down menu, or the Distribution Management Component's <i>Request</i> Screen.	Storage Management receives and logs (via MSS Logging Services) the Pull Volume Access Notification. Storage Management parses the notification and determines which files were retrieved by the user. The reference count for those files is decremented.	Update reference counters.	3.11.1.6-1 3.11.1.6-2

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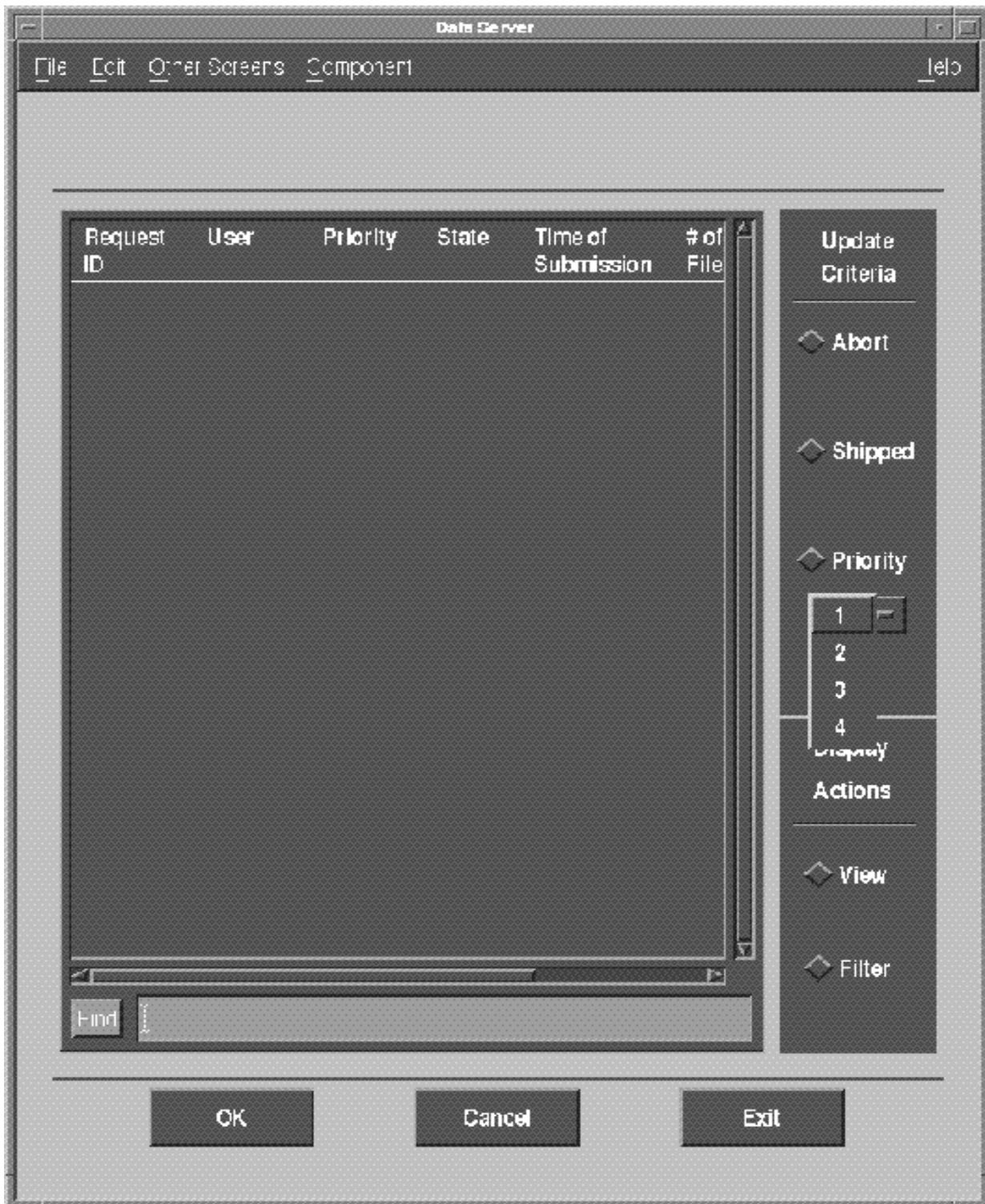
<sup>6</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

### 3.11.1.7 Postconditions

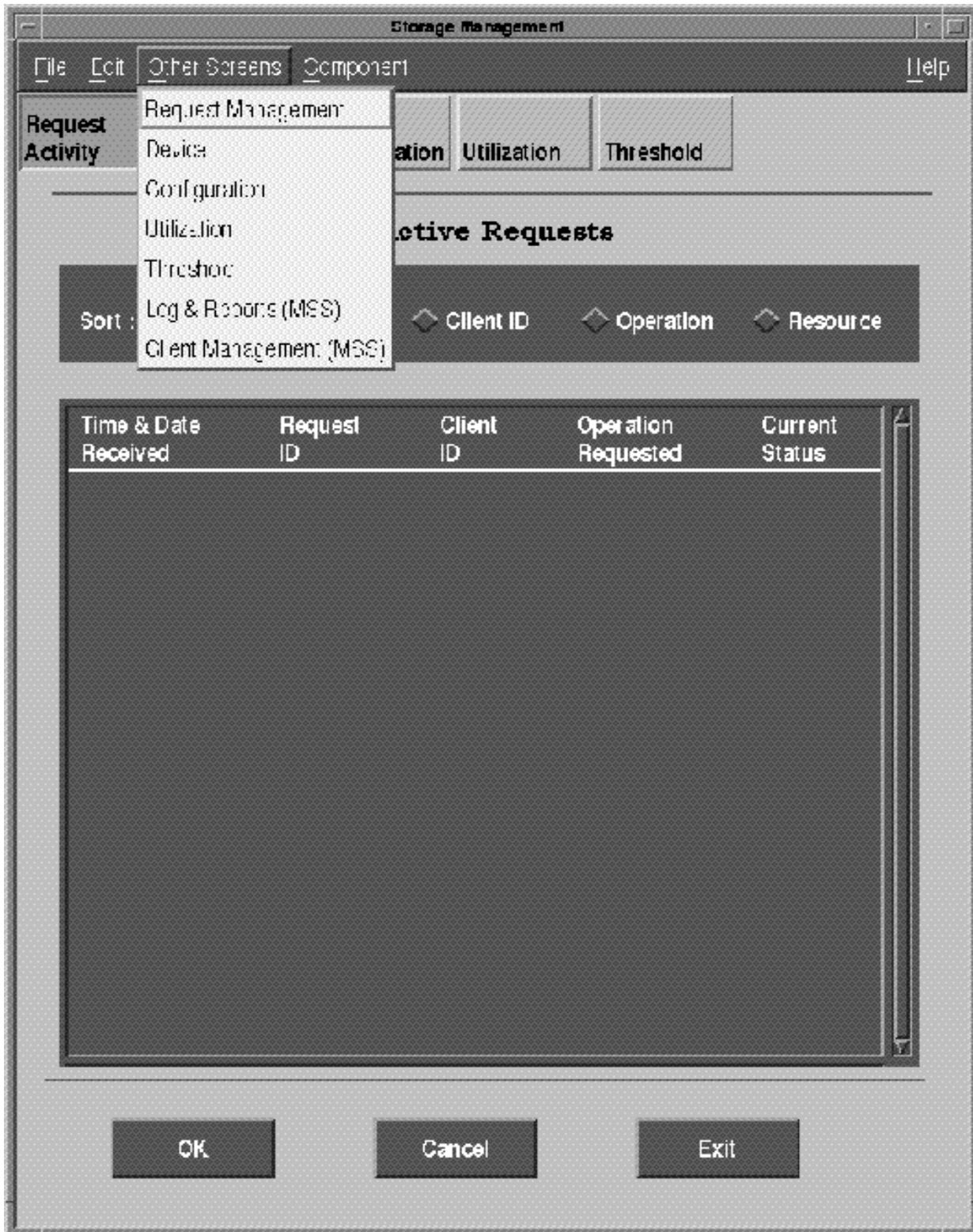
Storage Management can be configured to automatically delete files on the pull volume when the reference count reaches zero or it can wait a DAAC configurable period of time before deleting the files and adding the associated disk space to the free pool.



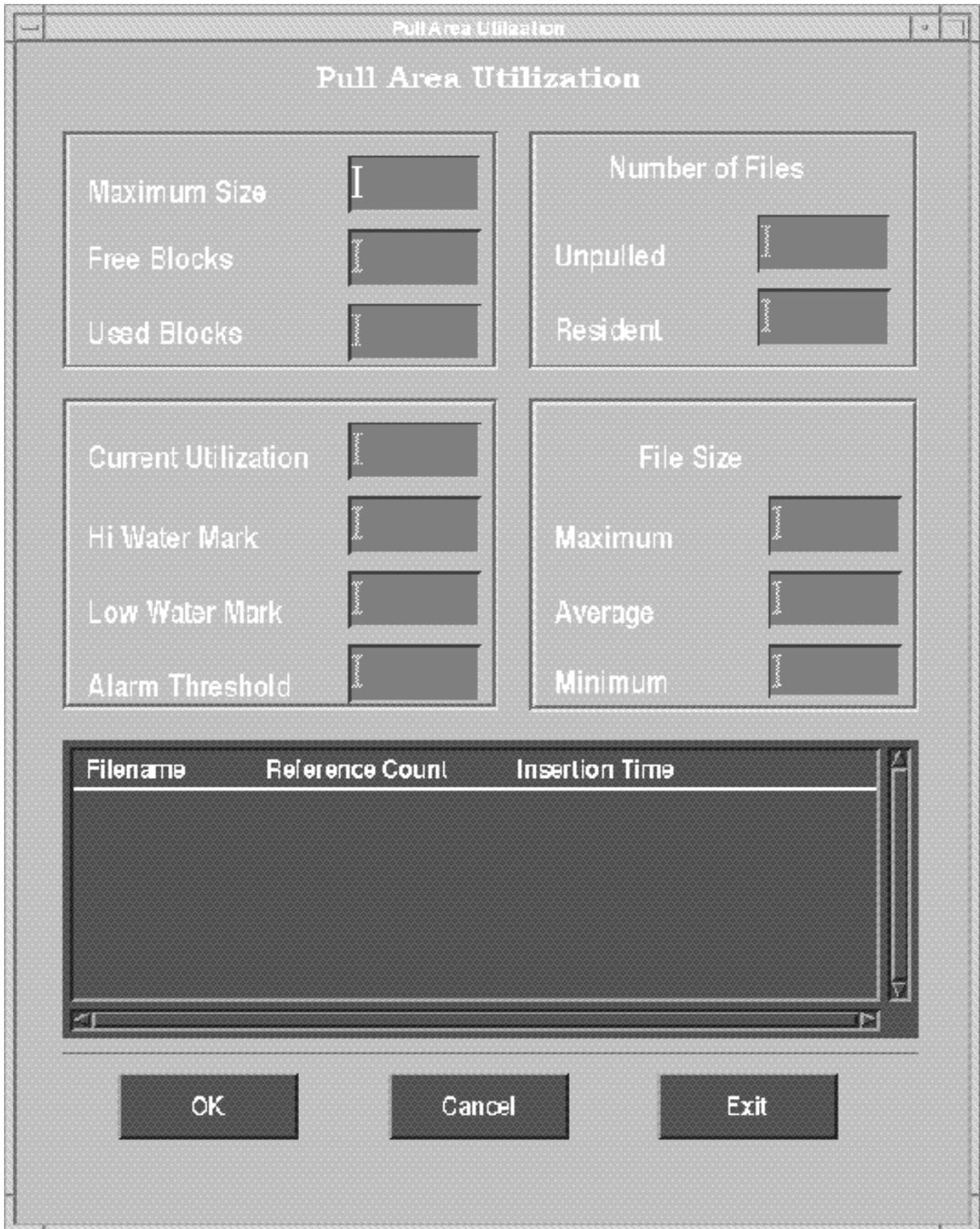
**Figure 3.11.1.6-1. DSS System Management Login Dialog**



**Figure 3.11.1.6-2. Distribution Management (Home) - Requests**



**Figure 3.11.1.6-3. Storage Management - Main Menu**



**Figure 3.11.1.6-4. Storage Management - Pull Area Utilization**

### 3.11.2 Network Data Distribution (Push) Scenario (Nominal)

#### 3.11.2.1 Scenario Description

This scenario describes the process and affected components when data is being distributed via an external network. The mechanism for distribution is a File Transfer Protocol (ftp). For data push operations, data will be staged to Working Storage and then transferred to the requestor. The distribution request specifies the necessary system, path and security information to allow the transfer. A notification is sent to the user when data has been transferred. Data will remain on the Working Storage area for a specific time interval established via DAAC Policy. A nominal network push distribution scenario is described in Table 3.11.2.6-1.

#### 3.11.2.2 Frequency

There is no routine schedule for data distribution request via network push. As per Project direction, we are assuming 1/2 of all distribution is handled via electronic distribution. For the purposes of this discussion we will assume the average request size is 5 GB. We will also assume that 25% of electronic distributions are Push rather than Pull. Based on these assumptions the following is the number of electronic Push distribution requests that will be seen at each DAAC per day. (Note that electronic Push is a fully automated function.) Readers interested in the volumes associated with these data granules are referred to the ECS IDR Technical Baseline.

DAAC	Number of Electronic Push Requests
GSFC	20
EDC	22
JPL	2
LaRC	8
ORNL	2
ASF	4
NSIDC	1

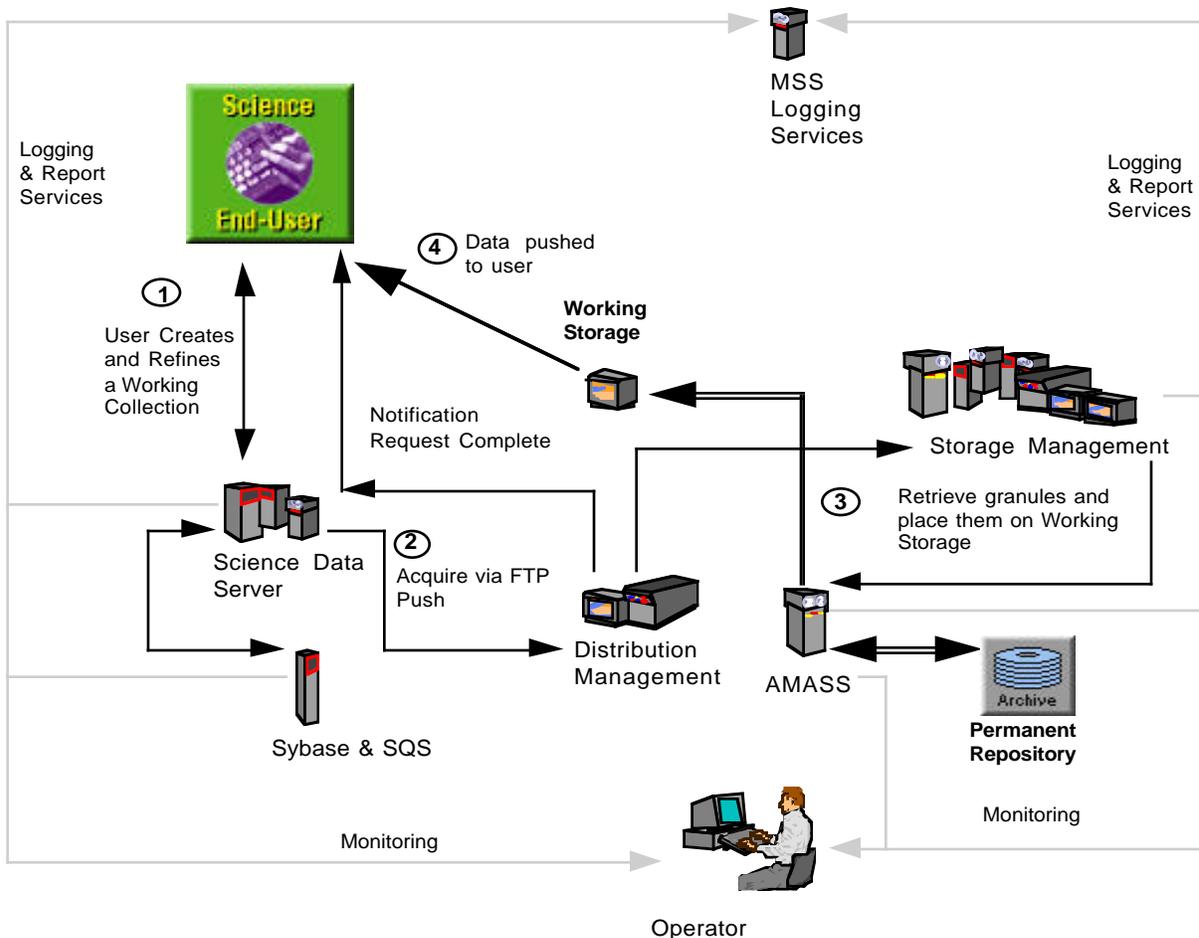
#### 3.11.2.3 Assumptions

This scenario assumes all components are Active and not in any degraded modes of operations. A user connects to the system and performs a search for a specific data product. When the system notifies the user that the product is found, the user requests an ftp push of that data (the user supplies all necessary security information that would enable placing the requested data directly on the user's system). The data is retrieved from the archive and placed on the Data Server Working Storage. The data is pushed to the user's system and a notification is sent upon completion.

#### 3.11.2.4 Components

This scenario involves the following Data Server Components: Science Data Server, MD CSC (Sybase), Storage Management, FMS CSC (AMASS), Working Storage HWCI, Data Repository

HWCI, and MSS Logging & Report Services. Figure 3.11.2.4-1 represents the components utilized in a data server electronic data push.



**Figure 3.11.2.4-1. Network Data Distribution (Push) Scenario (Nominal) Components**

### 3.11.2.5 Preconditions

The data server is fully functional with a nominal activity rate of 50%.

### 3.11.2.6 Detailed Steps of the Process

Table 3.11.2.6-1 represents the details of this scenario. The times and duration given are approximate.

**Table 3.11.2.6-1. Network Data Distribution (Push) Scenario (Nominal) Process (1 of 2)**

Step	Est <sup>1</sup> Time	Operator/User	System	Purpose	Figure
1	1 - 5 min	A user establishes a client session to a Data Server and creates a working collection of data. The Data Distribution (DDIST) Technician may examine the progress of a request by pulling down the <i>Other Screens</i> option in the DSS-OSM and selecting <i>Logs &amp; Reports (MSS)</i> to browse the log files provided by MSS.	The Data Server assigns a session ID and logs the initiation of the session. The Data Server logs (via MSS Logging Services) and queues the search request sent by the user to create a working collection and searches the Metadata Database in accordance with the user's indicated search attributes when the request is reached in the request queue. Identified granules are returned to the user's working collection.	Establish a Data Server session and initiate a search.	3.11.2.6-1
2	1 - x min <sup>2</sup>	The user refines the contents of the working collection to specific granules of high interest. The user invokes an acquire (via ftp push) service to obtain the high interest granules.	The Data Server logs (via MSS Logging Services) and queues subsequent search requests to identify high interest granules and searches the Metadata Database in accordance with the user's refined search attributes when the request is reached in the request queue. The user's working collection is updated with the results of each subsequent search. Distribution Management logs (via MSS Logging Services) the acquire via ftp push request. When the request thread is processed, Distribution Management sends a Data Retrieval Request to Storage Management listing the granules of high interest to be retrieved.	Refine search criteria to high interest data and acquire this data.	

<sup>1</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

<sup>2</sup>The time required to refine the contents of a working collection is a function of the data server load and the size and complexity of a user's query.

Step	Est <sup>3</sup> Time	Operator/User	System	Purpose	Figure
3	1 - x min <sup>4</sup>	The DDIST Technician may check request status at any time using the <i>DSS-OSM Request Screen</i> .	Storage Management logs (via MSS Logging Services) and queues the Data Retrieval Request. When the request is reached in the request queue, Storage Management re-requests the appropriate granules be retrieved from the archive via the Archive Management OTS Product. The granules are placed on the Working Storage and a Data Retrieval Request completed message is logged and sent to Distribution Management.	Retrieve the appropriate granules and place them on the user pull volume.	3.11.2.6-2
4	1 - x min <sup>5</sup>	The DDIST Technician may further examine the status of requests pressing the <i>Filter button</i> to reach the <i>Filter Requests</i> Screen from the Distribution Management <i>Requests</i> Screen or by using the <i>Request</i> Screen in DSS System Management.	Distribution Management provides login, system, and security information received in the Acquire via ftp Push, to Storage Management. Storage Management utilizes CSS Services to push the high interest granules to the user's system. Distribution Management logs (via MSS Logging Services) a distribution complete message and sends a distribution completed notification to the client or emails the user if no client is active.	Distribute data and notify user that data is available.	3.11.2.6-3 3.11.2.6-4 3.11.2.6-2

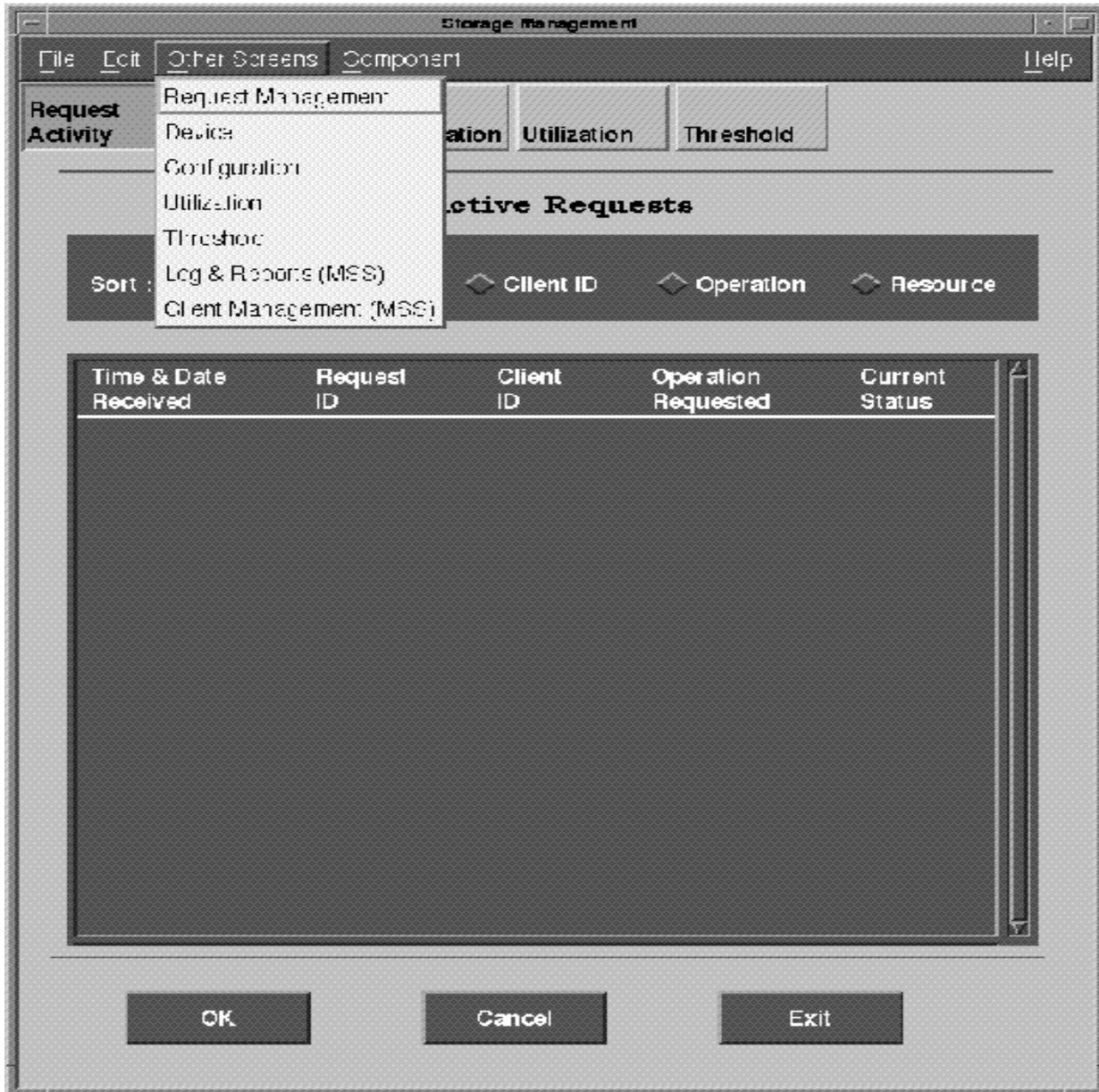
<sup>3</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

<sup>4</sup>The time required to retrieve granules from the permanent archive is directly related to the number and relative sizes of the files composing the granules of interest.

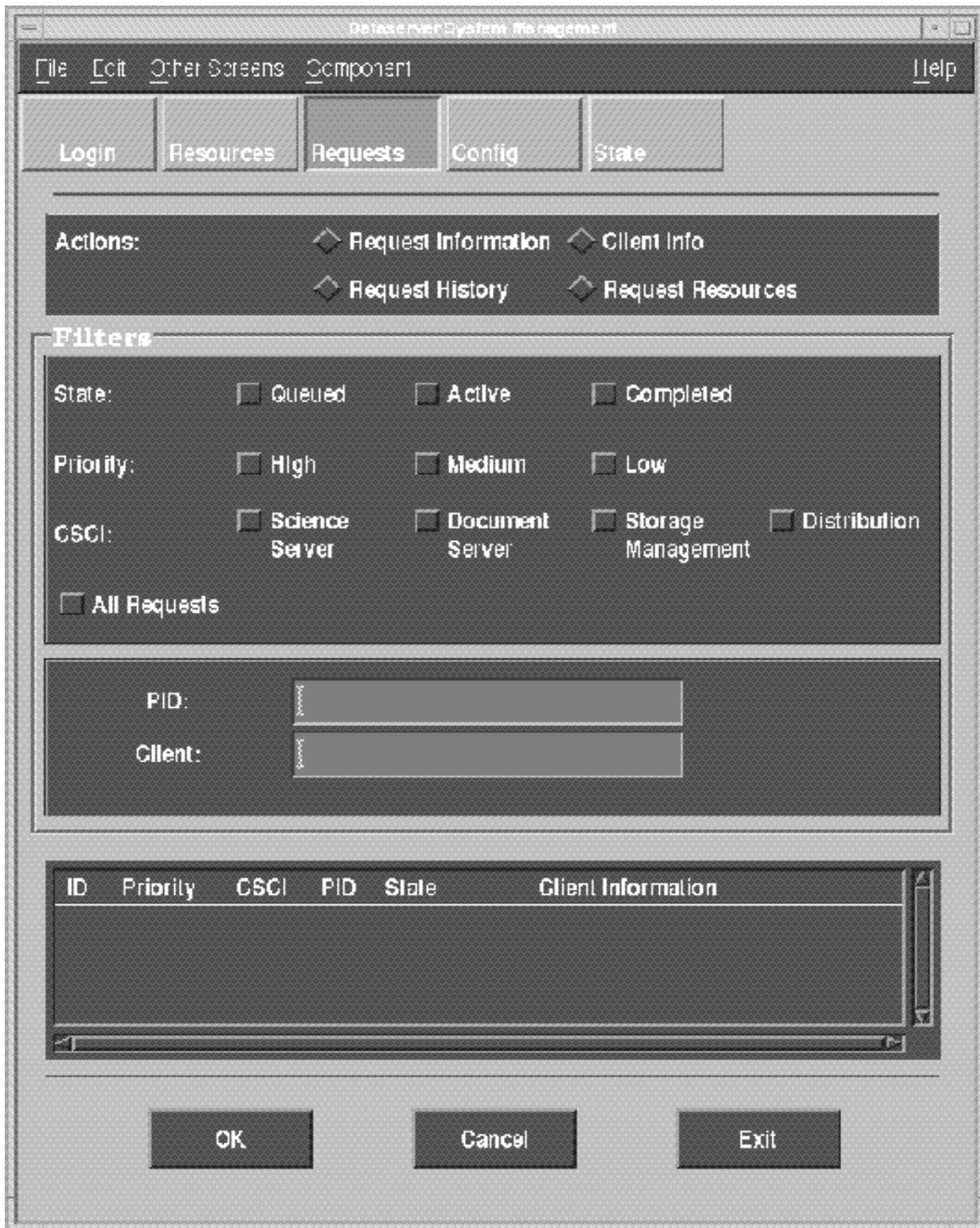
<sup>5</sup>The time required to distribute granules from working storage is dependent on the current activity of the system and the number and relative sizes of the files composing the transfer.

### 3.11.2.7 Postconditions

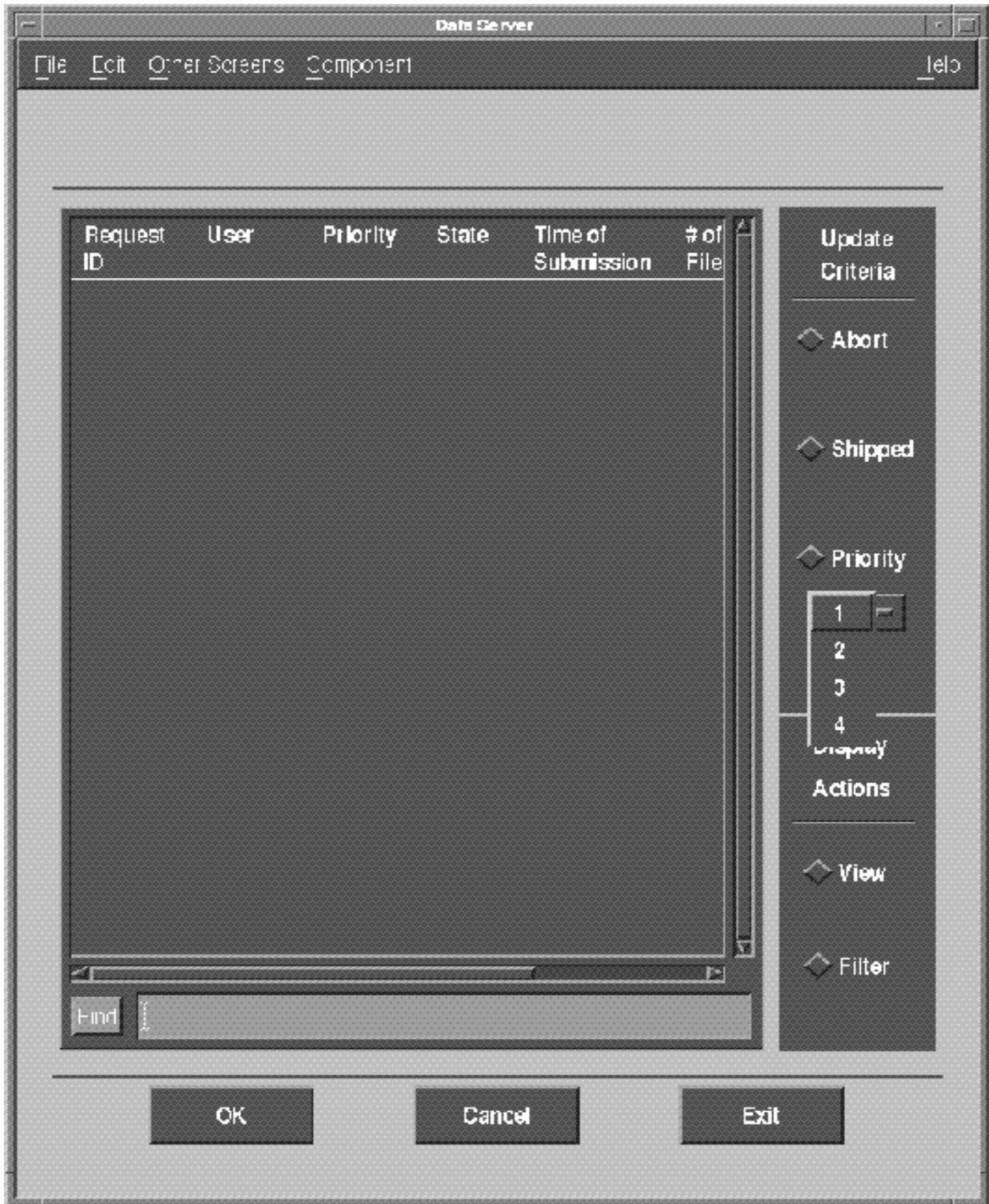
The Working Storage space associated with the completed request is freed by data server when the request completes.



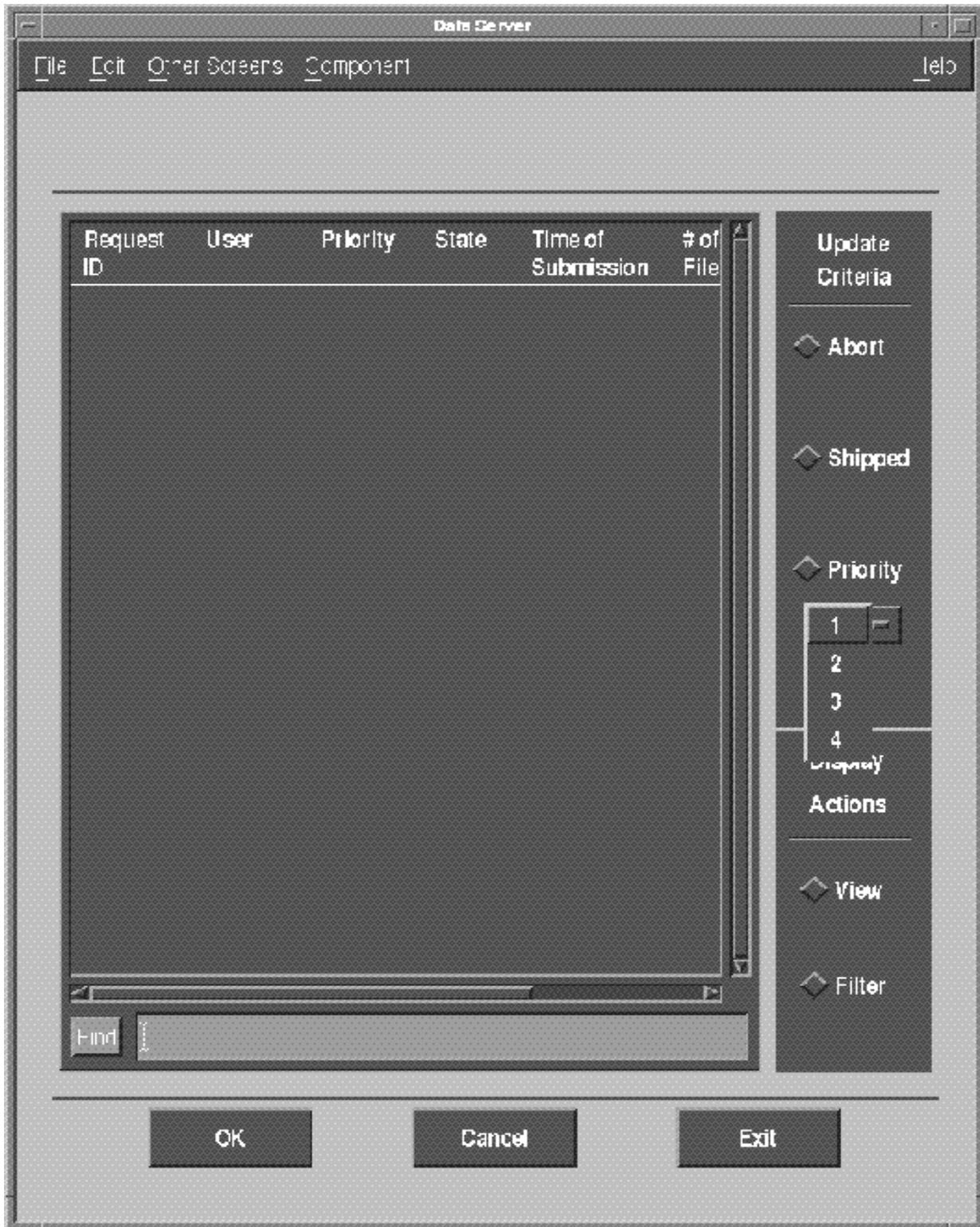
**Figure 3.11.2.6-1. DSS System Management - Other Screens - Logs and Reports (MSS)**



**Figure 3.11.2.6-2. DSS System Management - Request**



**Figure 3.11.2.6-3. Distribution Management (Home) - Requests**



**Figure 3.11.2.6-4. Distribution Management - Filter Requests**

### **3.11.3 Network Data Distribution (Push) Scenario (Fault)**

#### **3.11.3.1 Scenario Description**

This scenario describes the process and affected components when data is being distributed via an external network or internally to another subsystem. The mechanism for distribution is a File Transfer Protocol (ftp). For data push operations, data will be staged to Working Storage and then transferred to the requestor. The distribution request specifies the necessary system, path and security information to allow the transfer. A notification is sent to the user when data has been transferred. Data will remain on the Working Storage area for a specific time interval established via DAAC Policy.

A user connects to the system and performs a search for a specific data product. When the system notifies the user that the product is found, the user requests an ftp push of that data (the user supplies all necessary security information that would enable placing the requested data directly on the user's system). The data is retrieved from the archive and placed on the Data Server Working Storage. Data Server connects to the user's system and begins data transfer. A fault occurs at this time, severing the link to the user's system. The Data Server retries N times (where N is determined by DAAC Policy). If none of the retries are successful, the request is canceled, and the requestor is notified of the failure via E-mail (since E-mail servers can be configured to store and retry in the event of a failure, proper configuration by the DAAC of the E-mail server will allow the notification to be delivered after the user's system reconnects to the Internet). One potential network push fault scenario is described in Table 3.10.3.6-1.

#### **3.11.3.2 Assumptions**

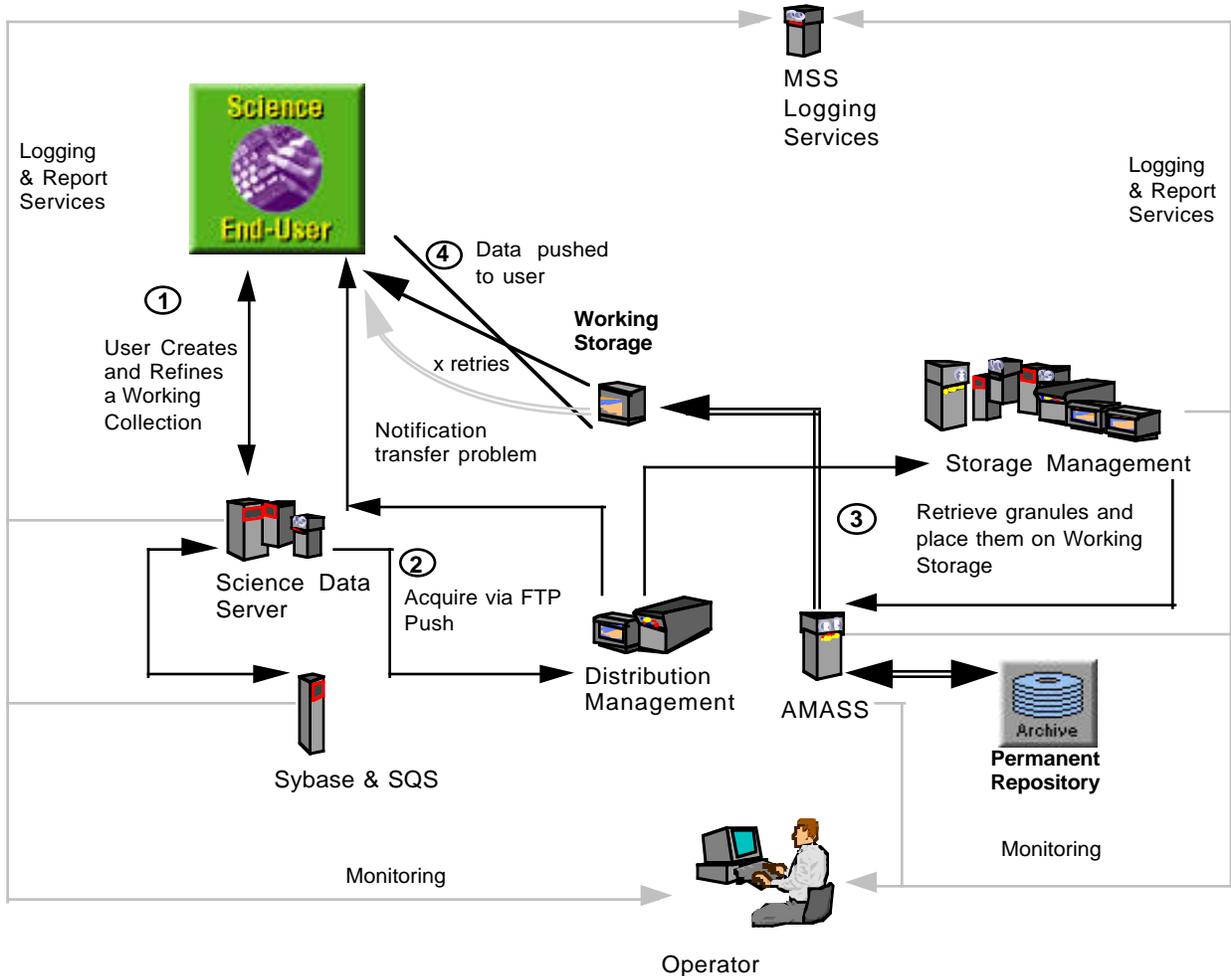
The user submits a request via a client and waits for the data to be delivered to his system.

#### **3.11.3.3 Frequency**

There is no routine schedule for network (push) distribution. This service is performed on an ad hoc or as required basis.

#### **3.11.3.4 Components**

This scenario involves many components of the Data Server. These included the Working Storage HWCI, Science Data Server, MD CSC (Sybase), Storage Management, FMS CSC (AMASS), the Data Repository HWCI, Distribution Management, and the external network. Figure 3.11.3.4 1 represents the components utilized in a data server electronic data push.



**Figure 3.11.3.4-1. Network Data Distribution (Push) Scenario (Fault) Components**

### 3.11.3.5 Preconditions

The user's available disk space is less than the volume of data in the request due to several core dump files in the system directory.

### 3.11.3.6 Detailed Steps of the Process

Table 3.11.3.6-1 represents the details of this scenario. The times and duration given are approximate.

**Table 3.11.3.6-1. Network Data Distribution (Push) Scenario (Fault) Process (1 of 2)**

Step	Est <sup>1</sup> Time	Operator/User	System	Purpose	Figure
1	1 - 5 min	A user establishes a client session to a Data Server and creates a working collection of data.	The Data Server assigns a session ID and logs (via MSS Logging Services) the initiation of the session. The Data Server logs and queues the search request sent by the user to create a working collection and searches the Metadata Database in accordance with the user's indicated search attributes when the request is reached in the request queue. Identified granules are returned to the user's working collection.	Establish a Data Server session and initiate a search.	
2	1 - x min <sup>2</sup>	<p>The user refines the contents of the working collection to specific granules of high interest. The user invokes an acquire (via ftp push) service to obtain the high interest granules.</p> <p>The operator can track progress of a request and review any errors recorded by using either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu or can view actual request status's via the Distribution Management Component's <i>Request</i> Screen.</p>	The Data Server logs (via MSS Logging Services) and queues subsequent search requests to identify high interest granules and searches the Metadata Database in accordance with the user's refined search attributes when the request is reached in the request queue. The user's working collection is updated with the results of each subsequent search. Distribution Management logs and queues the acquire via ftp push request. When the request thread is processed, Distribution Management sends a Data Retrieval Request to Storage Management listing the granules of high interest to be retrieved.	Refine search criteria to high interest data and acquire this data.	3.11.3.6-1 3.11.3.6-2

<sup>1</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

<sup>2</sup>The time required to refine the contents of a working collection is a function of the data server load and the size and complexity of a user's query.

Step	Est <sup>3</sup> Time	Operator/User	System	Purpose	Figure
3	1 - x min <sup>4</sup>	The operator can review progress for any request via either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu or via the Storage Management Component's <i>Logs &amp; Reports (MSS)</i> submenu available on the <i>Other Screens</i> pull down menu.	Storage management logs (via MSS Logging Services) and queues the Data Retrieval Request. When the request is reached in the request queue, Storage Management requests the appropriate granules be retrieved from the archive via the Archive Management OTS Product. The granules are placed on the Working Storage and a Data Retrieval Request completed message is logged and sent to Distribution Management.	Retrieve the appropriate granules and place them on the user pull volume.	3.11.3.6-1 3.11.3.6-3
4	1 - 3 min <sup>5</sup>	The operator can track progress of a request and review any errors recorded by using either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu or can view actual request status's via the Distribution Management Component's <i>Logs &amp; Reports (MSS)</i> submenu available on the <i>Other Screens</i> pull down menu.	Distribution Management utilizing login, system and security information in the Data Distribution Request, attempts to push the high interest granules to the user's system. The transfer is interrupted. Distribution Management waits a prescribed interval and retries. The wait and retry sequence repeats until successful transmission or until the DAAC Policy specified number of retries is exceeded <sup>6</sup> . Distribution Management sends a Distribution Request Failure Message to the operator console (via MSS Logging Services) and passes on a distribution failure notification to the user's client or via email to the user if no client is active.	Data distribution failed. Request failure reported. Notify the user.	3.11.3.6-1 3.11.3.6-2

<sup>3</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

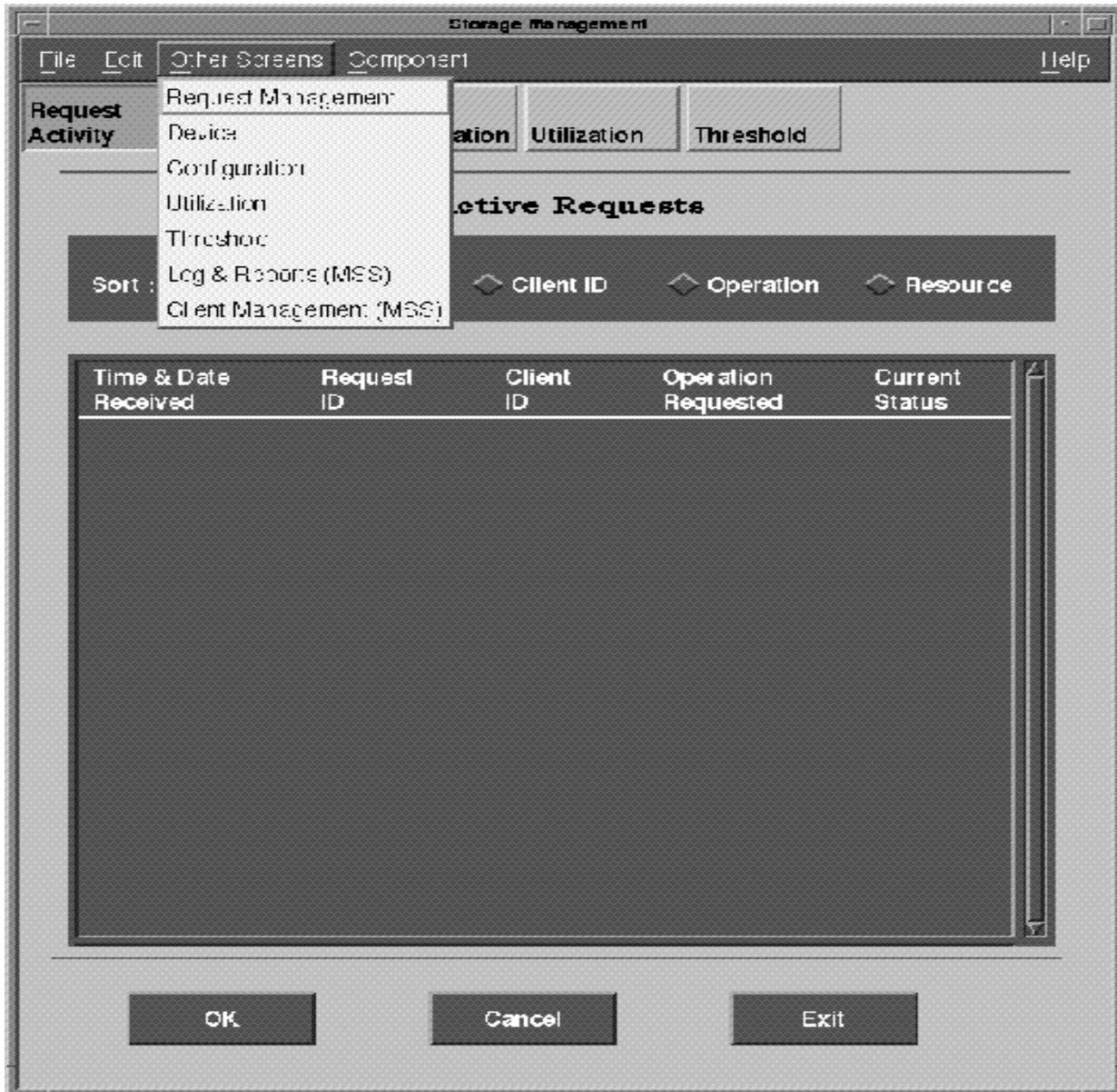
<sup>4</sup>The time required to retrieve granules from the permanent archive is directly related to the number and relative sizes of the files composing the granules of interest.

<sup>5</sup>This estimate does not include retry interval or transfer time.

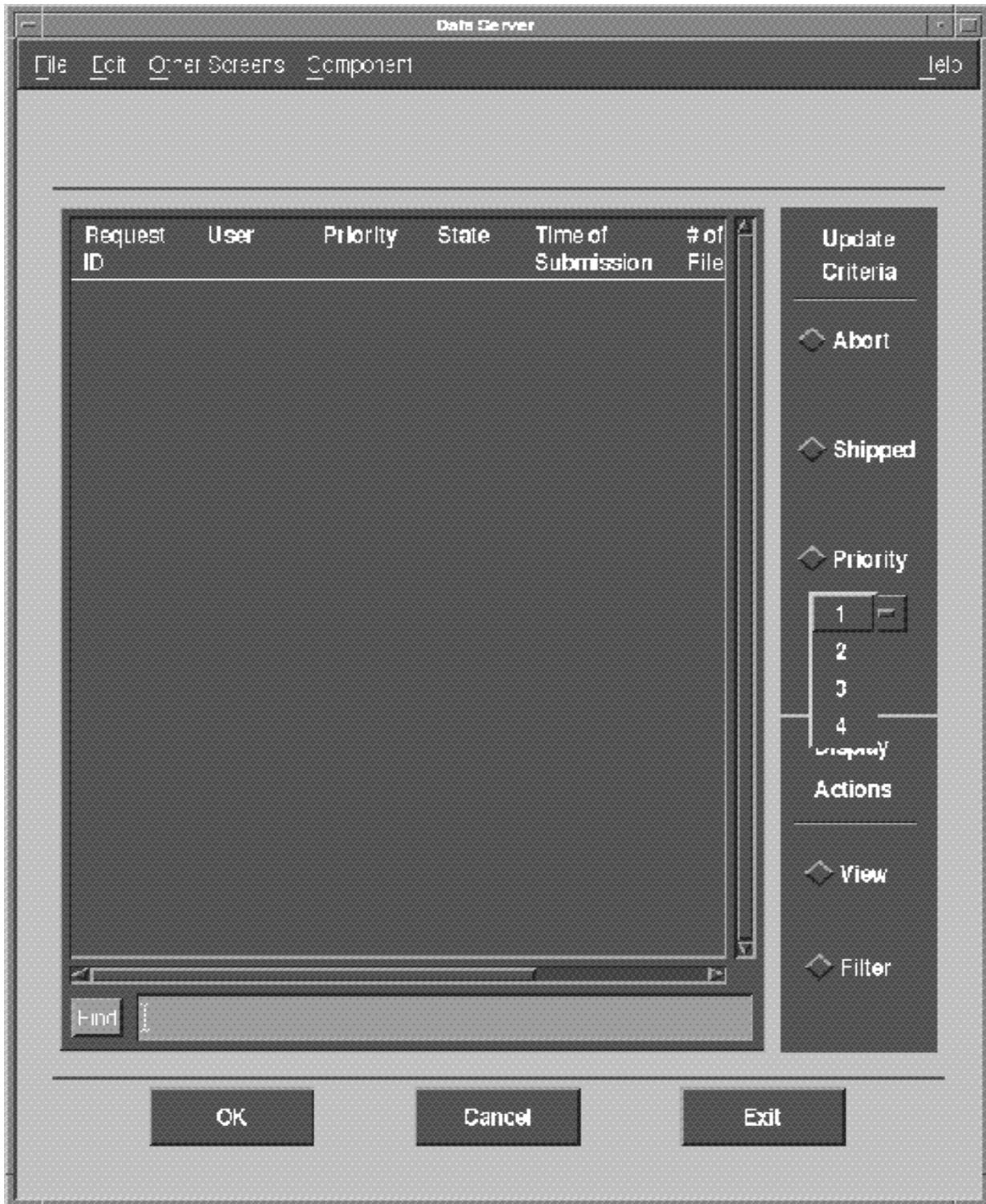
<sup>6</sup>Error/failure message evaluation and retry period adjustment is not provided in Release A.

### 3.11.3.7 Postconditions

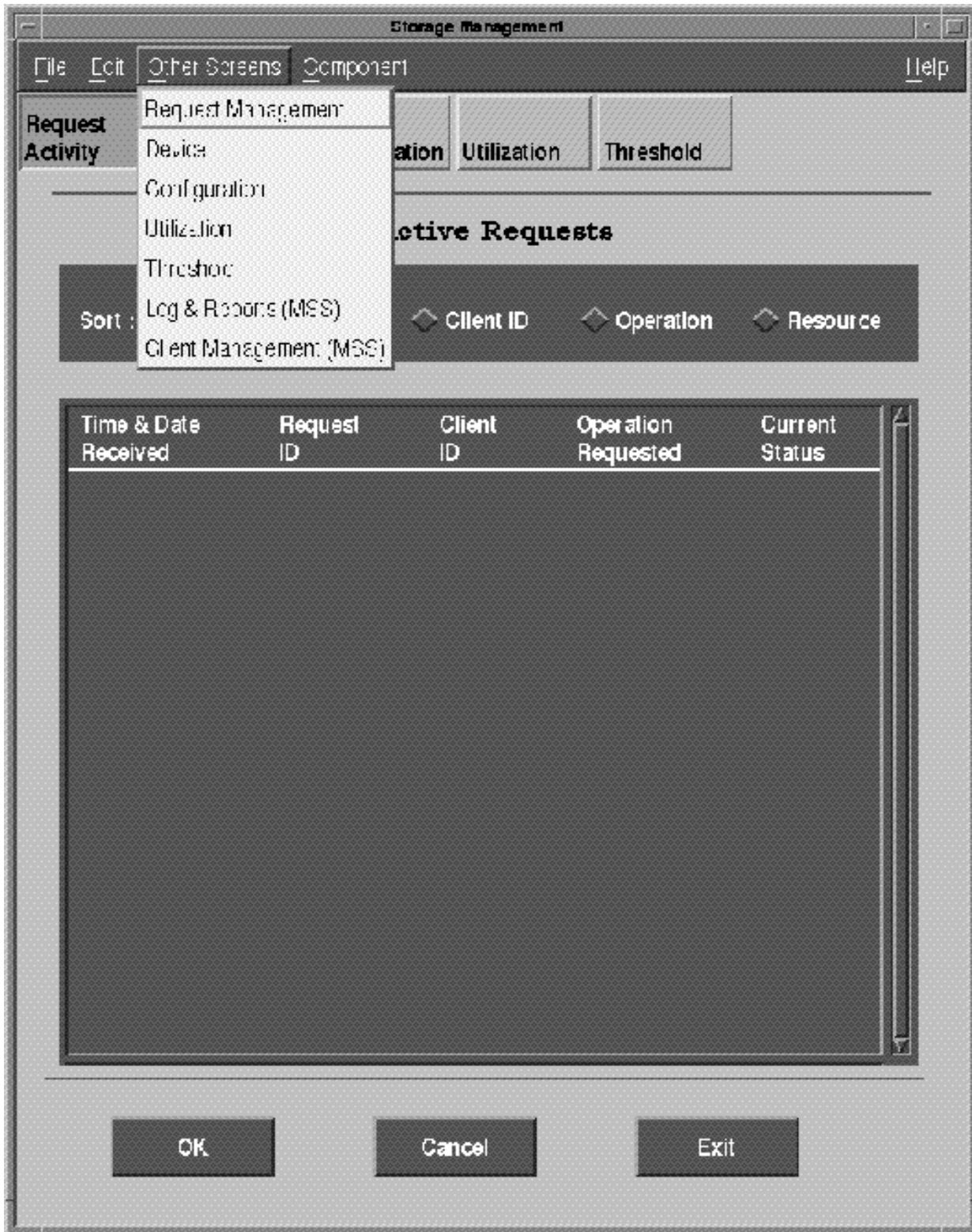
The user deletes the core dump files and resubmits the request for processing. This occurs prior to the DAAC configurable Working Storage Residency time for the user's requested data. The request is processed quickly since Storage Management recognizes and notifies Distribution Management where the data is available in Working Storage.



**Figure 3.11.3.6-1. DSS System Management - Other Screens - Logs and Reports (MSS)**



**Figure 3.11.3.6-2. Distribution Management (Home) - Requests**



**Figure 3.11.3.6-3. Storage Management - Main Menu**

### 3.11.4 Physical Media Distribution Scenario

#### 3.11.4.1 Scenario Description

This scenario describes the process and affected components when data is being distributed via physical media. The mechanism for distribution is Unix tar or cpio formatted granules on a physical data volume (e.g. 6250, 4mm, 8mm, 3480/3490 tape) and Unix structured file system, tar, or cpio for CD ROM. For physical media operations, data will be staged to Working Storage and then transferred to the Physical Media Distribution Volume. The distribution request specifies the necessary Unix data format, compression method if any, and media form factor required. A notification is sent to the user when data has been shipped. Data will remain on the Working Storage area for a specific time interval established via DAAC Policy. One of many potential physical media distribution scenarios is described in Table 3.11.4-1.

#### 3.11.4.2 Frequency

There is no routine schedule for physical media distribution. As per Project direction, we are assuming 1/2 of all distribution is handled via media. For the purposes of this discussion we will assume the average request size for data is 5 GB. Based on these assumptions the following is the number of physical media distribution requests that will be seen at each DAAC per day. (Note that DAACs have different operational staffed hours to work off this distribution load.)

DAAC	Number of Hard Media Requests
GSFC	81
EDC	88
JPL	2
LaRC	33
ORNL	6
ASF	15
NSIDC	1

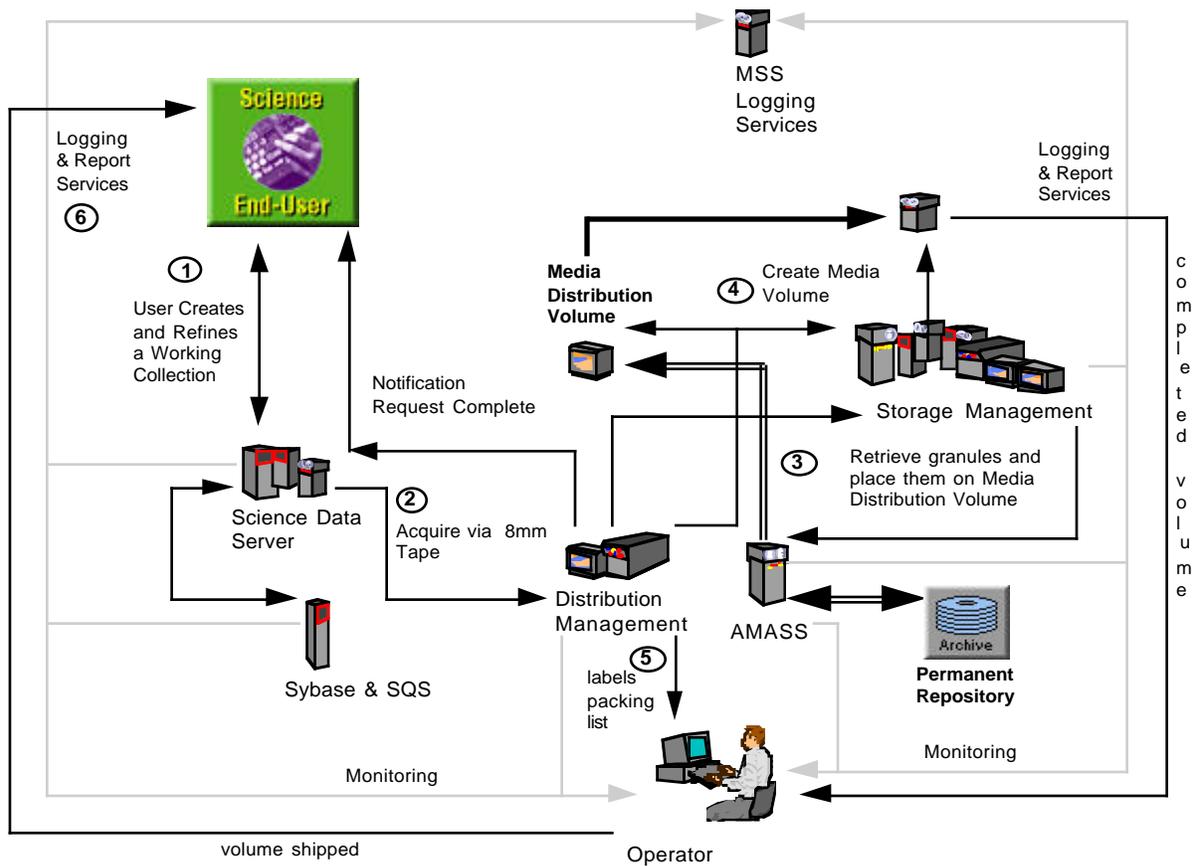
Assuming a 5 GB average request size and a nominal media write rate of 2 MB/second, an average request will require 42 minutes to complete writing.

#### 3.11.4.3 Assumptions

This scenario assumes all components are Active and not in any degraded modes of operations. A user connects to the system and performs a search for a specific data product. When the system notifies the user that the product is found, the user requests a physical media distribution of the data. The data is retrieved from the archive and placed on the Data Server Working Storage. The data is transferred to the Physical Media Distribution Volume, copied to physical media, and shipped to the user. A E-mail message is sent to the user when the medium has been shipped.

### 3.11.4.4 Components

This scenario involves the following Data Server Components: Science Data Server, MD CSC (Sybase), Storage Management, FMS CSC (AMASS), Media Distribution Volume, Data Repository HWCI, an 8mm tape device, and MSS Logging & Report Services. Figure 3.11.4.4-1 represents the components involved in DSS physical media distribution.



**Figure 3.11.4.4-1. Physical Media Distribution Scenario Components**

### 3.11.4.5 Preconditions

The data server is fully functional with a nominal activity rate of 50%. The user has requested an 8mm tape distribution in tar format. There is an inactive 8mm device available to process this request.

### 3.11.4.6 Detailed Steps of the Process

Table 3.11.4.6-1 represents the details of this scenario. The times and duration given are approximate.

**Table 3.11.4-1. Physical Media Distribution Scenario Process (1 of 3)**

Step	Est <sup>1</sup> Time	Operator/ User	System	Purpose	Figure
1	1 - 5 min	<p>A user establishes a client session to a Data Server and creates a working collection of data.</p> <p>The Data Distribution (DDIST) Technician may examine the progress of a request by pulling down the <i>Other Screens</i> option in the DSS-OSM and selecting <i>Logs &amp; Reports (MSS)</i> to browse the log files provided by MSS.</p>	<p>The Data Server assigns a session ID and logs (via MSS Logging Services) the initiation of the session. The Data Server logs and queues the search request sent by the user to create a working collection and searches the Metadata Database in accordance with the user's indicated search attributes when the request is reached in the request queue. Identified granules are returned to the user's working collection.</p>	<p>Establish a Data Server session and initiate a search.</p>	3.11.4.6-1

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<sup>1</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

2	1 - x min <sup>2</sup>	The user refines the contents of the working collection to specific granules of high interest. The user invokes an acquire (via physical media) service to obtain the high interest granules.	The Data Server logs (via MSS Logging Services) and queues subsequent search requests to identify high interest granules and searches the Metadata Database in accordance with the user's refined search attributes when the request is reached in the request queue. The user's working collection is updated with the results of each subsequent search. Distribution Management logs (via MSS Logging Services) and queues the acquire via physical media request. When the request thread is processed , Distribution Management sends a Data Retrieval Request to Storage Management listing the granules of high interest to be retrieved.	Refine search criteria to high interest data and acquire this data.	
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<sup>2</sup>The time required to refine the contents of a working collection is a function of the data server load and the size and complexity of a user's query.

Step	Est <sup>3</sup> Time	Operator/ User	System	Purpose	Figure
3	1 - x min <sup>4</sup>	The DDIST Technician may check request status at any time using the DSS-OSM <i>Request Screen</i> .	Storage Management logs (via MSS Logging Services) and queues the Data Retrieval Request. When the request is reached in the request queue, Storage Management requests the appropriate granules be retrieved from the archive via the Archive Management OTS Product. The granules are placed on the Media Distribution Volume and a Data Retrieval Request completed message is logged and sent to Distribution Management.	Retrieve the appropriate granules and place them on the user pull volume.	3.11.4.6-2

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<sup>3</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

<sup>4</sup>The time required to retrieve granules from the permanent archive is directly related to the number and relative sizes of the files composing the granules of interest.

4	1 -x min <sup>5</sup>	The DDIST Technician may further examine the status of requests pressing the <i>Filter button</i> to reach the <i>Filter Requests</i> Screen from the <i>Distribution Management Requests</i> Screen or by using the <i>Request</i> Screen in DSS System Management.	Distribution Management provides format parameters received in the acquire via physical media request, to Storage Management. Storage Management generates the physical media volume requested by the user. Distribution Management generates volume labels, mailing labels, and a packing list. Distribution Management logs (via MSS Logging Services) the completion of media generation and alerts the Data Distribution Technician.	Distribute data and notify user that data is available.	3.11.4.6-3 3.11.4.6-4 3.11.4.6-2
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<sup>5</sup>The time necessary to create the physical media volume is dependent upon the device selected and the number and relative sizes of the files requested for distribution.

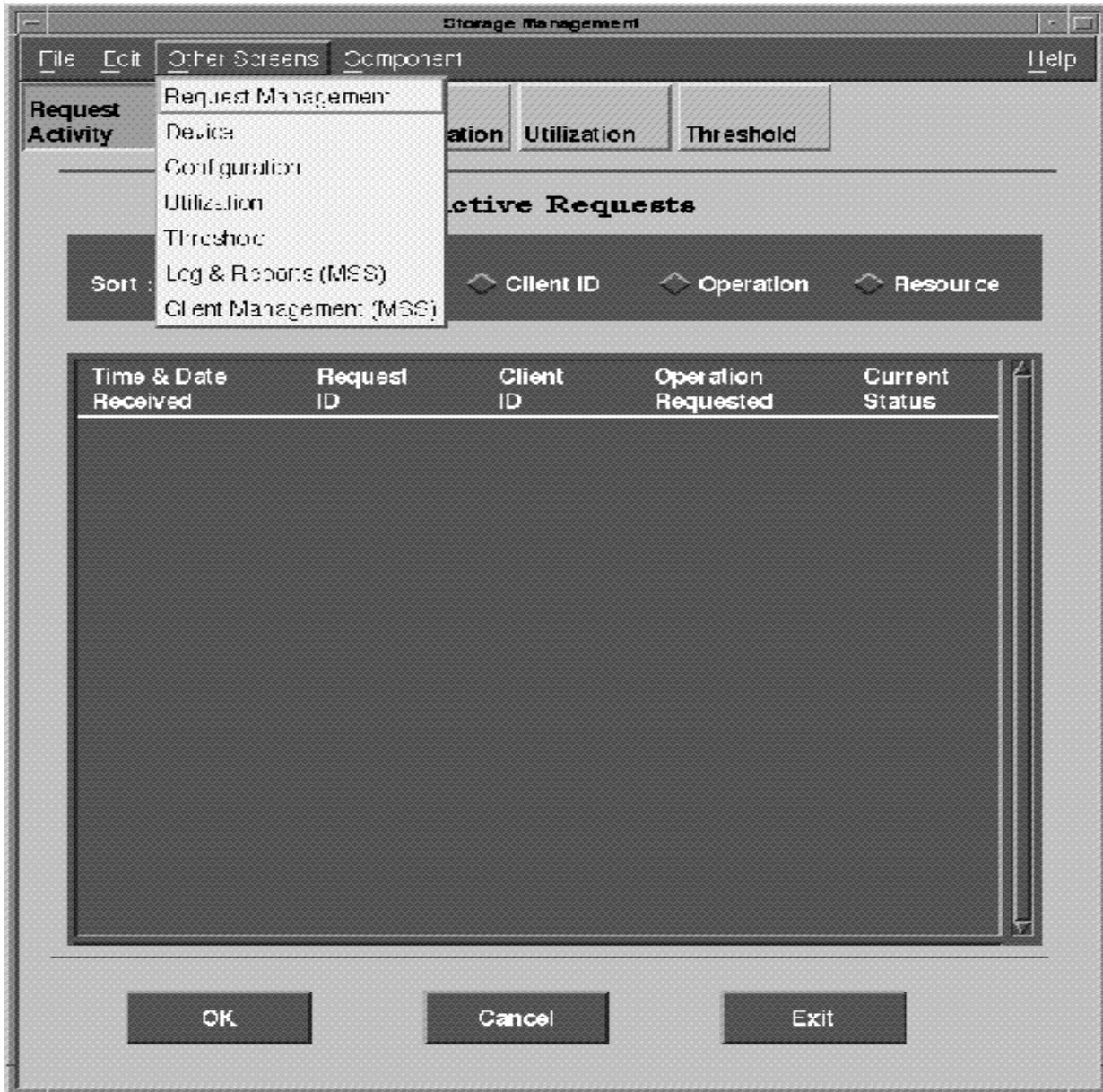
Step	Est <sup>6</sup> Time	Operator/User	System	Purpose	Figure
5	1 - 5 min	The DDIST Technician affixes the volume and mailing labels, packages the physical media volume along with the packing list, and ships the package. The operator then updates the status of the Distribution Management Request to "shipped" from the Distribution Management <i>Requests</i> Screen.		Package and ship the physical media volume.	3.11.4.6-3
6	1 - 5 min		Distribution Management receives and logs (via MSS Logging Services) the state change on the Distribution Management Request and sends an E-mail message to the requestor stating the requested medium has been shipped.	Notify user.	

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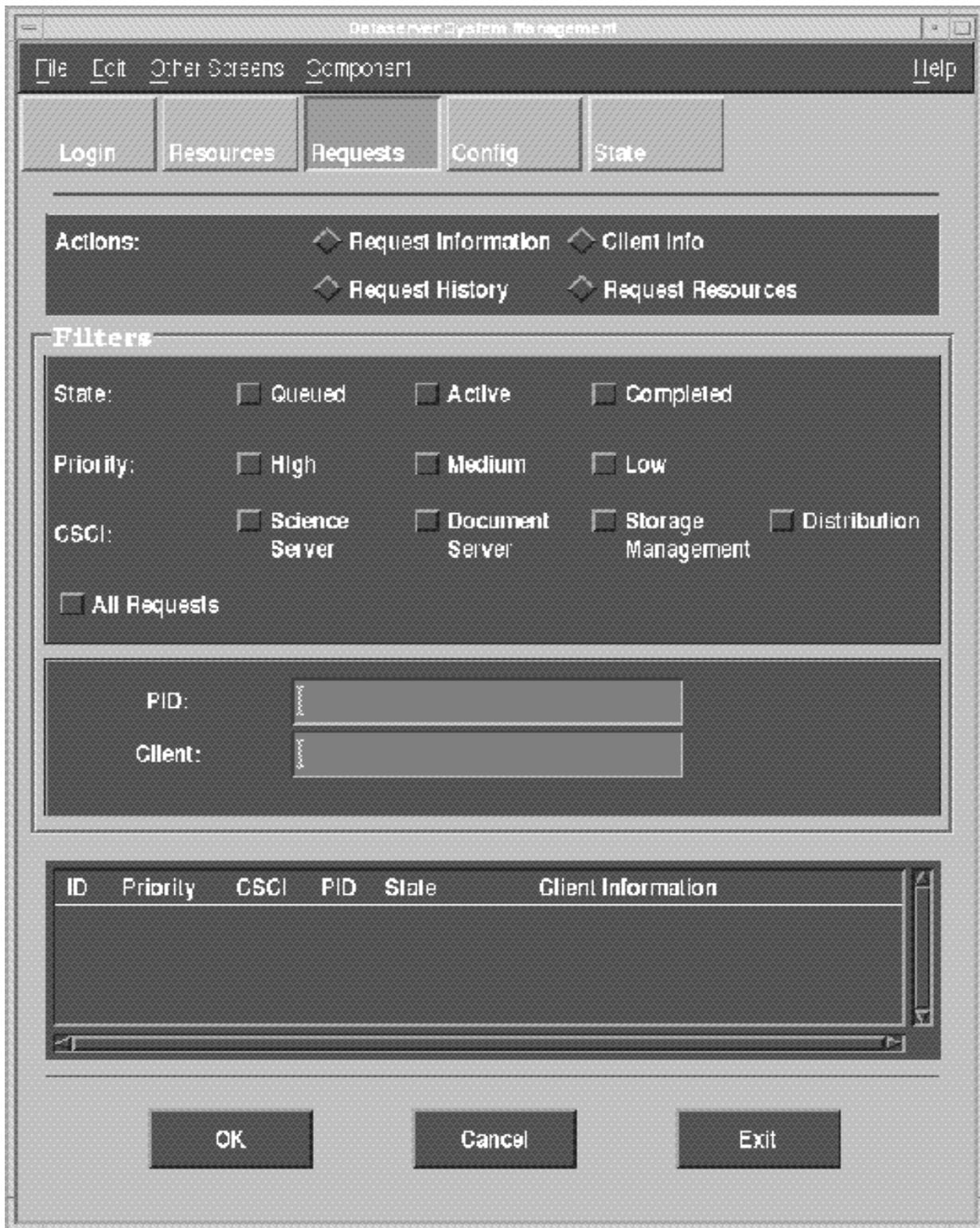
<sup>6</sup>Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

### 3.11.4.7 Postconditions

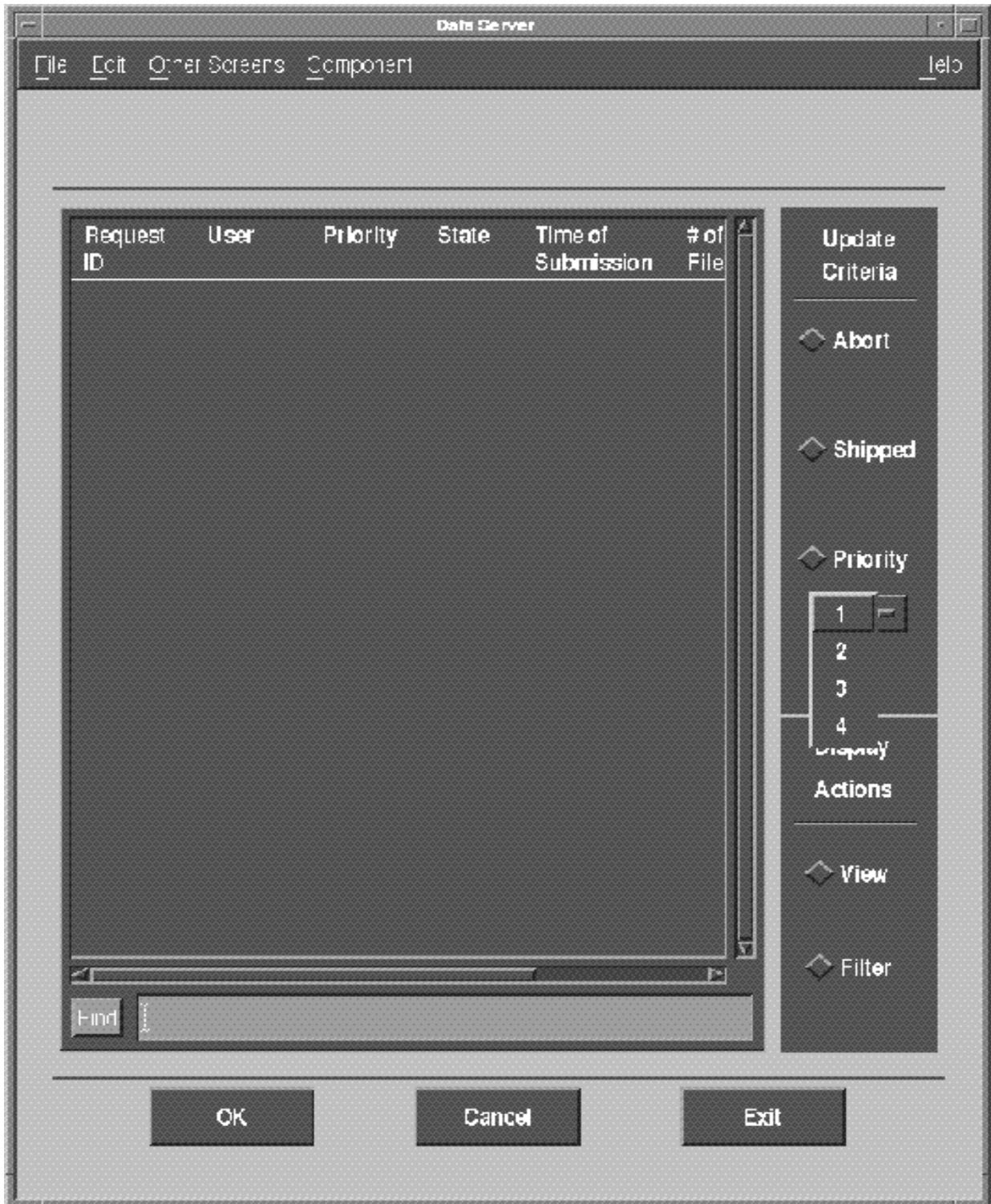
The Media Distribution Volume space associated with the completed request is freed in accordance with DAAC Policy. The Data Distribution Technician affixes labels, packages and ships the order in accordance with DAAC Policy.



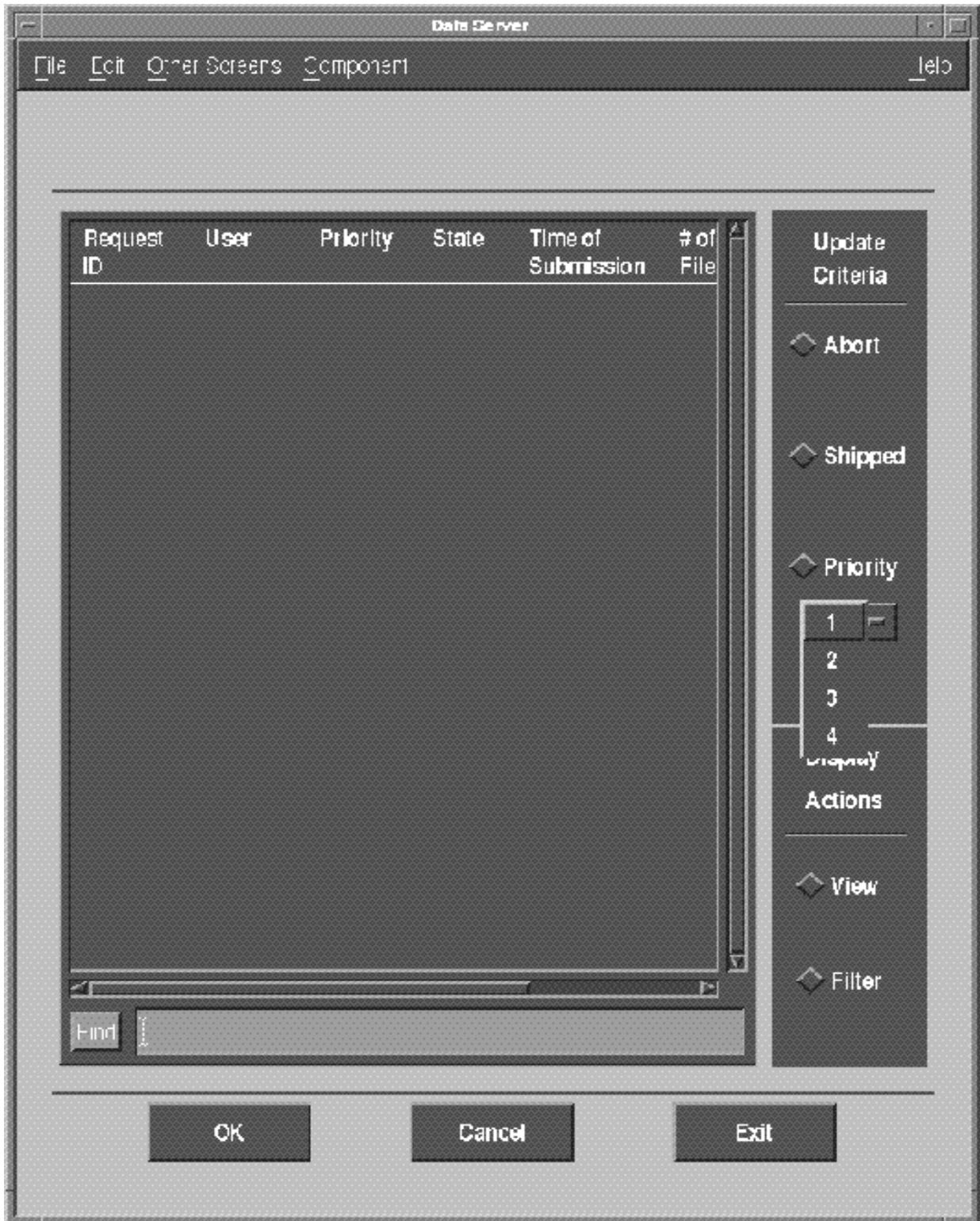
**Figure 3.11.4.6-1. DSS System Management - Other Screens - Logs and Reports (MSS)**



**Figure 3.11.4.6-2. DSS System Management - Request**



**Figure 3.11.4.6-3. Distribution Management (Home) - Requests**



**Figure 3.11.4.6-4. Distribution Management - Filter Requests**

### **3.11.5 Network Data Distribution (Pull) Scenario (Request From Hell)**

#### **3.11.5.1 Scenario Description**

The mechanism for distribution is a File Transfer Protocol (ftp). This scenario describes the process and affected components when data is requested for distribution via an external network and the request size exceeds the maximum number of files permitted in a request or the maximum capacity of the distribution system. Configurable parameters will exist for the maximum number of bytes in a request, and the maximum number of files in a request. The Distribution Management software will check each request against these limits. A request which exceeds either limit will be suspended with a new state of OPINT, indicating operator intervention required; the operator will also be notified of the existence of the request. Distribution Request status can be viewed via Distribution Submenu *Distribution List*. (This is the Distribution Management home screen). The requester will be notified that the request has been suspended because its size requires operator intervention and that the request will be processed as subrequests which will be delivered to the requester individually. (Via the client if the requestors session is still active or via E-mail.) The operator can view the details of the request via selection of a view function, which exists in the Release A CDR design and has been augmented to support operator sectioning of these large requests. The *View Request* Screen under Distribution Management has two additional service buttons *Delimit Subrequest* and *Submit Subrequest* to support "Request From Hell" distribution processing.

The display of the details of a distribution request include a list of the granules and files in the request, and their individual sizes and types. The operator will be able to position a cursor within this list to delimit (via a GUI-supported selection, the *Delimit Subrequest* button) where the request should be sectioned into multiple requests (termed subrequests). The operator will then be able to submit (via a GUI-supported selection, the *Submit Subrequest* button) - at his discretion - each of these subrequests for processing. For data push operations, data will be staged to Working Storage and then transferred to the requestor. The distribution request specifies the necessary system, path and security information to allow the transfer. Each submitted subrequest will be processed as an independent request, with generation of its own packing slip (if the distribution is via physical media) and notification to the requester when distribution is complete, with the notification also indicating the parent request of this subrequest. Notification to the requester of completion of the last subrequest will also indicate completion of the entire (parent) request. A nominal network push distribution scenario is described in Table 3.11.5.6-1.

#### **3.11.5.2 Frequency**

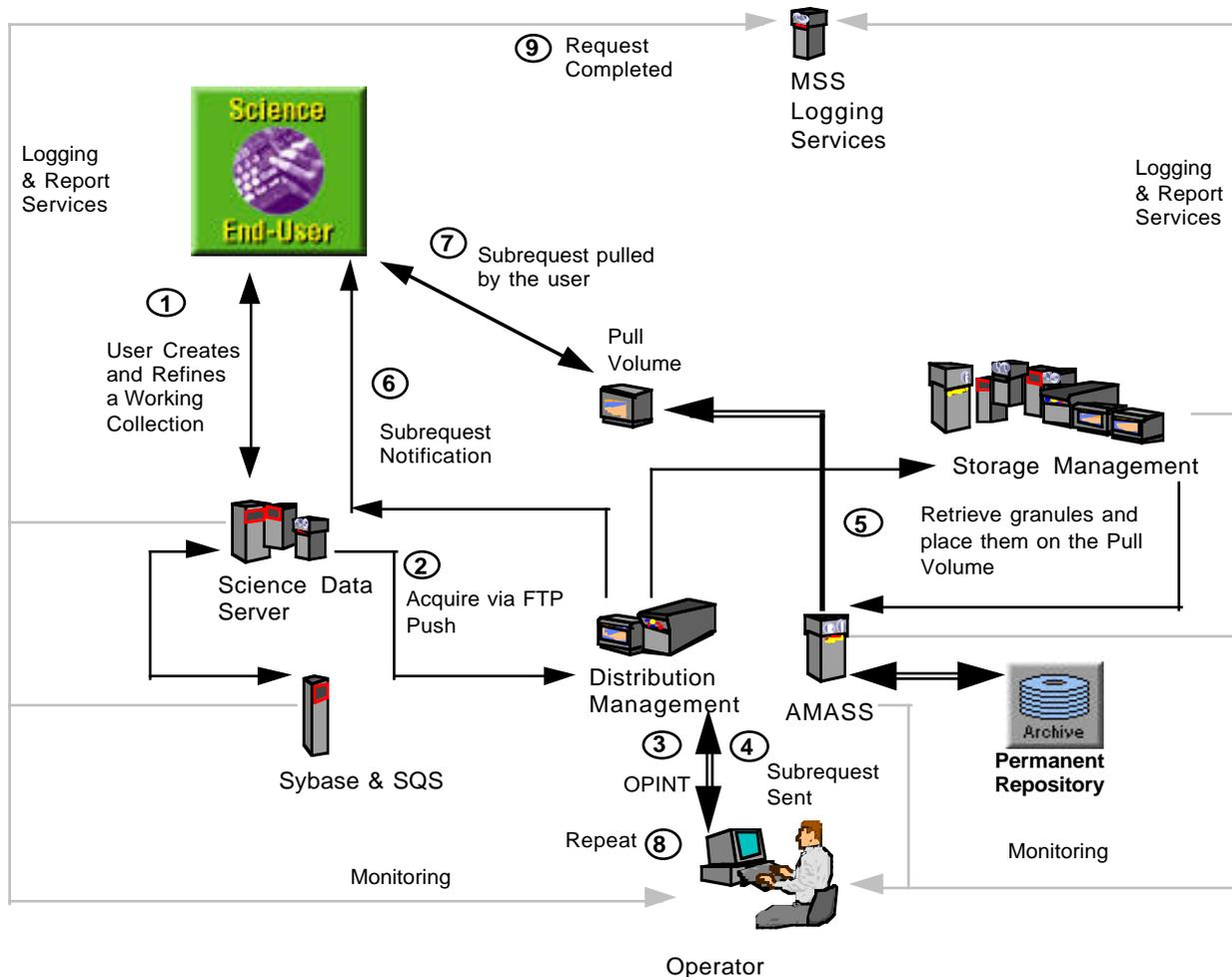
There is no routine schedule for "Request From Hell" distribution. This service is performed on an ad hoc or as required basis.

#### **3.11.5.3 Assumptions**

An authorized user has submitted an "acquire via ftp pull" request for archived data that exceeds both the number of files and total size thresholds for distribution requests established via DAAC Policy.

### 3.11.5.4 Components

This scenario involves many of the Data Server's components. These components include: The Working Storage HWCI, the Data Repository HWCI, the Distribution Management Pull Volume, Science Data Server CSCI, MD CSC (Sybase), Storage Management CSCI, FMS CSC (AMASS), and the Distribution Management CSCI. The scenario also involves MSS Logging & Report Services. Figure 3.11.5.4-1 represents the components utilized in a data server electronic data pull.



**Figure 3.11.5.4-1. Network Data Distribution (Pull) Scenario (Request From Hell) Components**

### **3.11.5.5 Preconditions**

The Data Server Subsystem is performing at an nominal activity level of 50% load. All components are functioning within normal parameters. No components are down for maintenance.

### **3.11.5.6 Detailed Steps of the Process**

Table 3.11.5.6-1 represents the details of this scenario. The times and duration given are approximate.

**Table 3.11.5.6-1. Network Data Distribution (Pull) Scenario (Request From Hell) Process (1 of 4)**

Step	Est <sup>1</sup> Time	Operator/User	System	Purpose	Figure
1	1 - 5 min.	A user establishes a client session to a Data Server and creates a working collection of data.	The Data Server assigns a session ID and logs (via MSS Logging Services) the initiation of the session. The Data Server logs and queues the search request sent by the user to create a working collection and searches the Metadata Database in accordance with the user's indicated search attributes when the request is reached in the request queue. Identified granules are returned to the user's working collection.	Establish a Data Server session and initiate a search.	
2	1 - 5 min.	The user is interested in all data in the working collection, and an acquire (via ftp pull) service to obtain all granules.	Distribution Management logs (via MSS Logging Services) the Acquire Via ftp Pull Request and detects the request exceeds configurable size parameters. The request is suspended with a status of OPINT, the operator is notified that the request requires operator intervention, and the user is notified the request exceeds size parameters and if it is processed, it will be processed as separate subrequests.	Acquire this data.	
3	1 - 5 min.	The Data Distribution (DDIST) Technician receives an alarm and examines the Request queue via the Distribution Management <i>Requests</i> Screen. The DDIST Technician highlights the Request with an OPINT status and clicks the <i>View</i> button.		Examine request queue and determine problem and corrective action.	3.11.5.6-2

<sup>1</sup>Note: these are estimated times at present. No granularity of less than a minute is provided at present though some requests will likely take only seconds to process.

Step	Est <sup>2</sup> Time	Operator/User	System	Purpose	Figure
4	1 - 5 min.	The DDIST Technician is placed on the <i>View Request</i> Screen. The operator selects the <i>Delimit Subrequest</i> button. The operator highlights a group of files in the first delimited section and clicks the <i>Submit Subrequest</i> button. The DDIST Technician may, in turn, submit all remaining sub requests, (starting a new thread for each) or he may wait and process the remaining requests later.	Distribution Management logs (via MSS Logging Services) the Acquire Via ftp Pull Subrequest and sends a Data Retrieval Request to Storage Management listing the granules to be retrieved and placed on Distribution Management Pull Volume.	Subrequest generated and submitted.	3.11.5.6-5

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<sup>2</sup>Note: these are estimated times at present. No granularity of less than a minute is provided at present though some requests will likely take only seconds to process.

5	1 - x min <sup>3</sup>	The DDIST Technician may view Pull Area Utilization data via the Storage Management Component's <i>Pull Area Utilization</i> Screen.	Storage Management logs (via MSS Logging Services) and queues the Data Retrieval Request. When the request is reached in the request queue, Storage Management requests the appropriate granules be retrieved from the archive via the Archive Management OTS Product. The granules are placed on the Distribution Management Pull Volume, the reference count for the granules is incremented, and a Data Retrieval Request completed message is logged and sent to Distribution Management.	Retrieve the appropriate granules and place them on the user push volume.	3.11.5.6-4
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<sup>3</sup>The time required to retrieve granules from the permanent archive is directly related to the number and relative sizes of the files composing the granules of interest.

Step	Est <sup>4</sup> Time	Operator/User	System	Purpose	Figure
6	1 - 5 min.	The DDIST Technician can review progress for any request via either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu or via the <i>Logs &amp; Reports (MSS)</i> submenu available on the <i>Other Screens</i> pull down menu available in any component.	Distribution Management sends a notification, which includes file and path names, to the requestor via an active client or an email message that the first subset of the Acquire via ftp Pull request is ready for retrieval.	Notify user that data is available.	3.11.5.6-1
7	1 - 5 min. after user pull	The users retrieves the requested data from the DAAC's pull volume.	CSS Subsystem detects and logs (via MSS Logging Services) that an authorized user has accessed specific files on the pull volume. CSS provides a Pull Volume Access Notification to Storage Management which enumerates the path names and files retrieved by an associated user ID.	User pulls data. ECS detects the pull and arranges volume cleanup.	
8	1 - 5 min.		Storage Management receives and logs (via MSS Logging Services) the Pull Volume Access Notification. Storage Management parses the notification and determines which files were retrieved by the user. The reference count for those files is decremented. DAAC Policy will determine if files are deleted immediately after their reference count reaches zero or they remain on disk for a period of time prior to deletion.	Update reference counters.	

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<sup>4</sup>Note: these are estimated times at present. No granularity of less than a minute is provided at present though some requests will likely take only seconds to process.

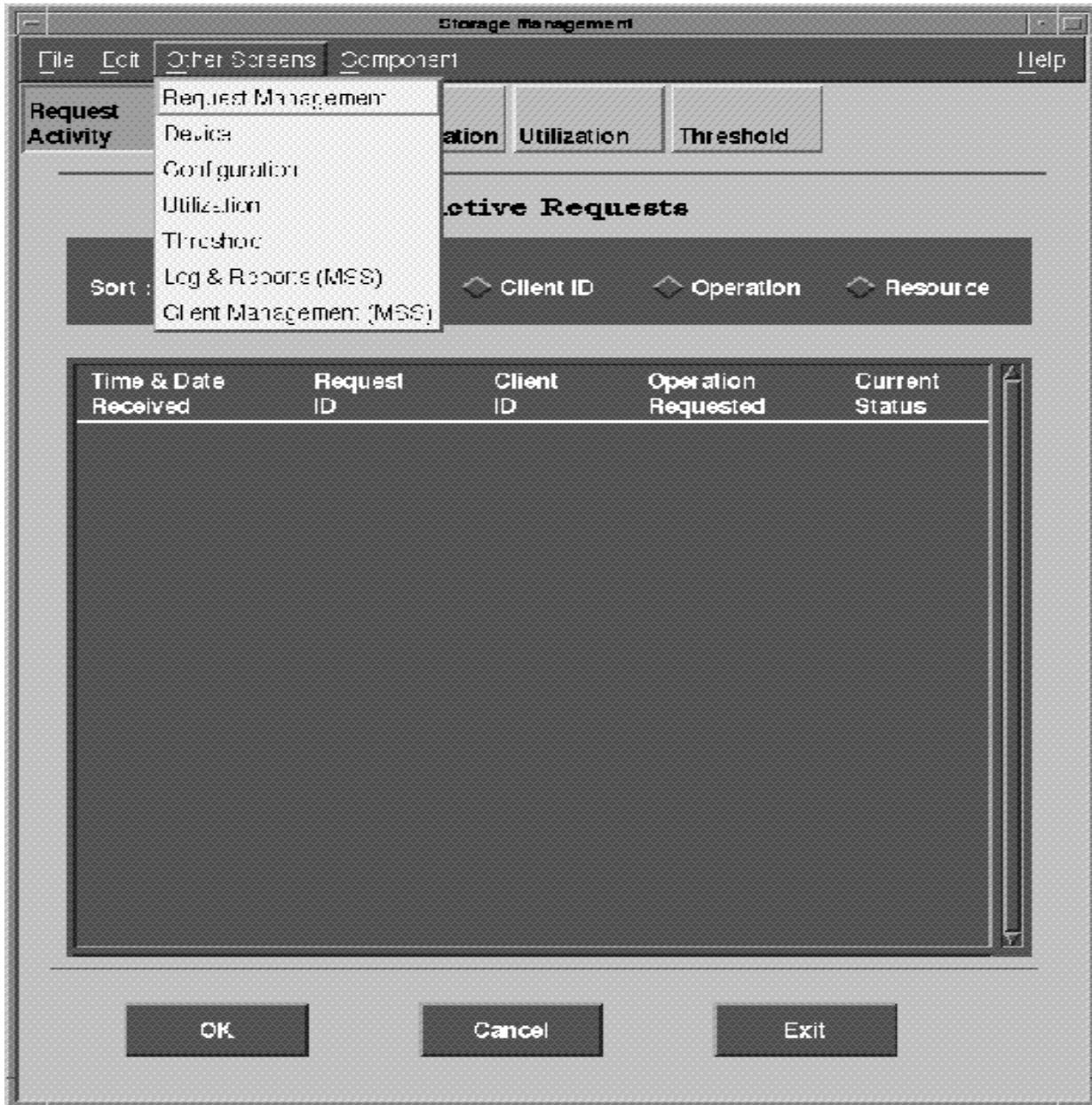
Step	Est <sup>5</sup> Time	Operator/User	System	Purpose	Figure
9	Not known	The DDIST Technician can verify request completion via either the <i>Other Screens</i> option and selecting <i>Logs &amp; Reports (MSS)</i> from DSS System Management main menu, the Storage Management Component's <i>Logs &amp; Reports (MSS)</i> submenu available on the <i>Other Screens</i> pull down menu, or the Distribution Management Component's <i>Requests</i> Screen.	Steps 5 - 8 repeat for each Subrequest until all have been pulled by the user. When processing of the final subrequest is complete the notification which Distribution Management provides to the requester indicates that all subrequests into which the request was sectioned have now been processed.	Continue distribution of the subrequests until the original request is completed.	3.11.5.6-1 3.11.5.6-3 3.11.5.6-2

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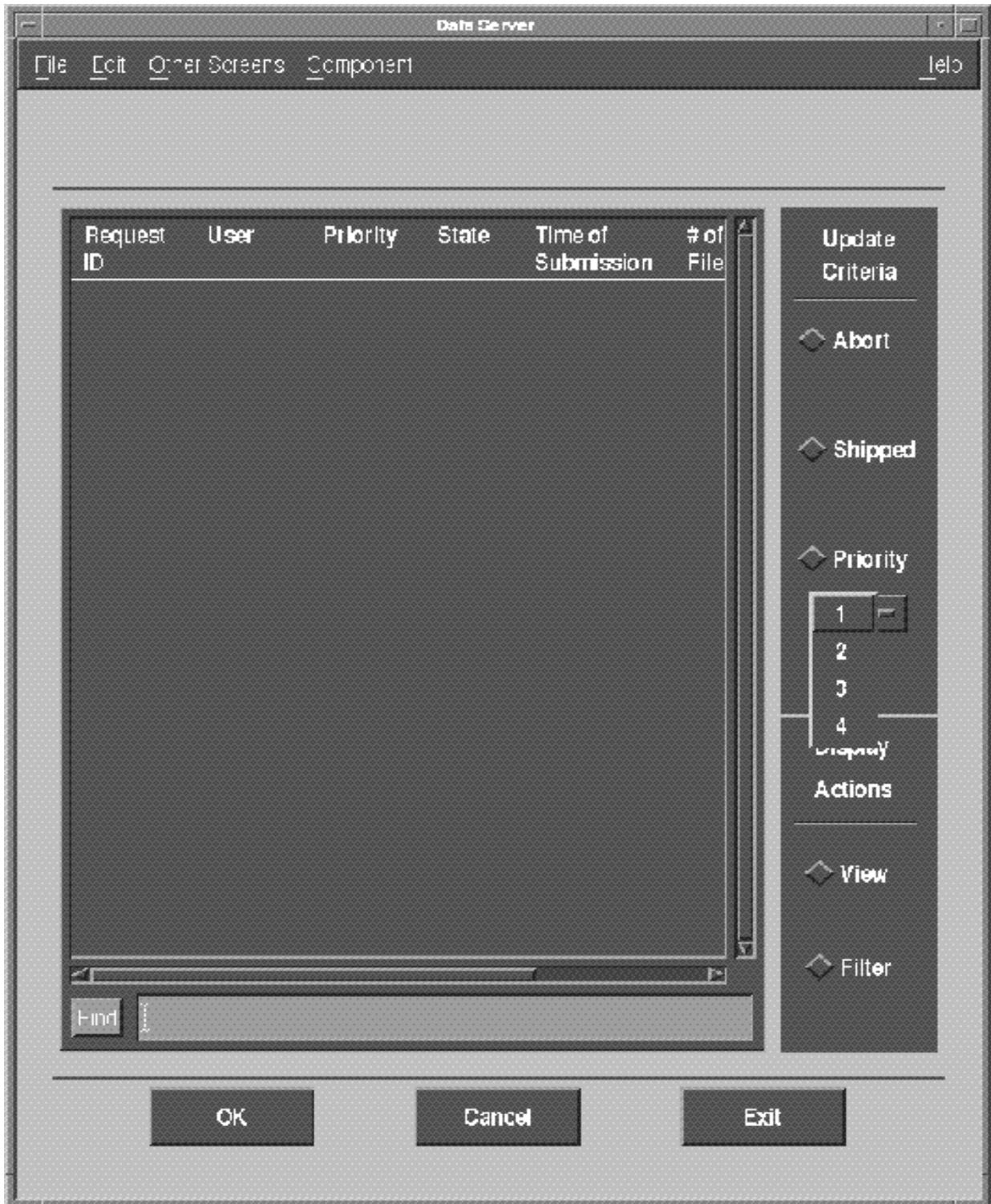
<sup>5</sup>Note: these are estimated times at present. No granularity of less than a minute is provided at present though some requests will likely take only seconds to process.

### 3.11.5.7 Postconditions

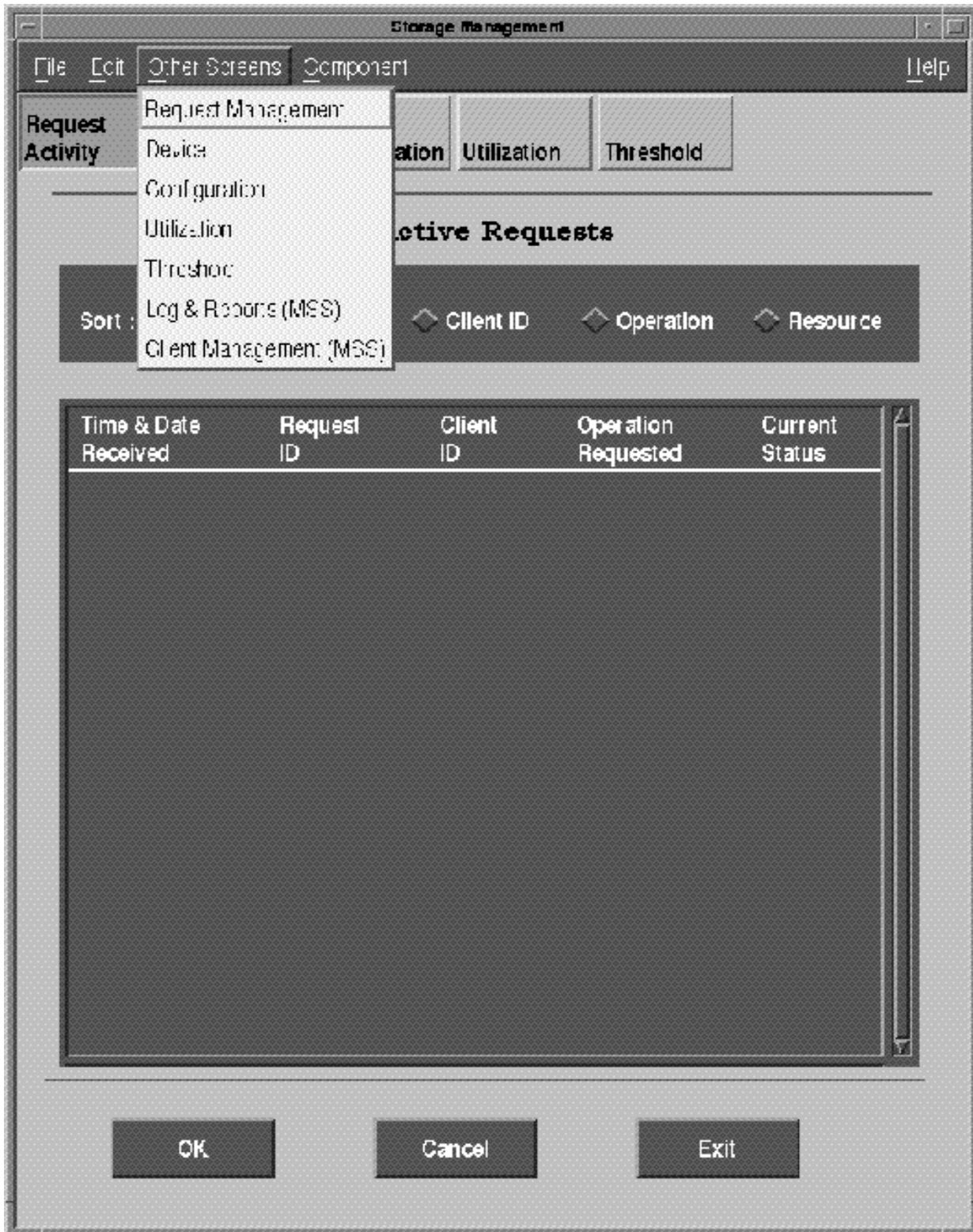
The subrequest threads are processed based on priority and available resources. The Pull Volume free space is reclaimed via time parameters established by DAAC Policy.



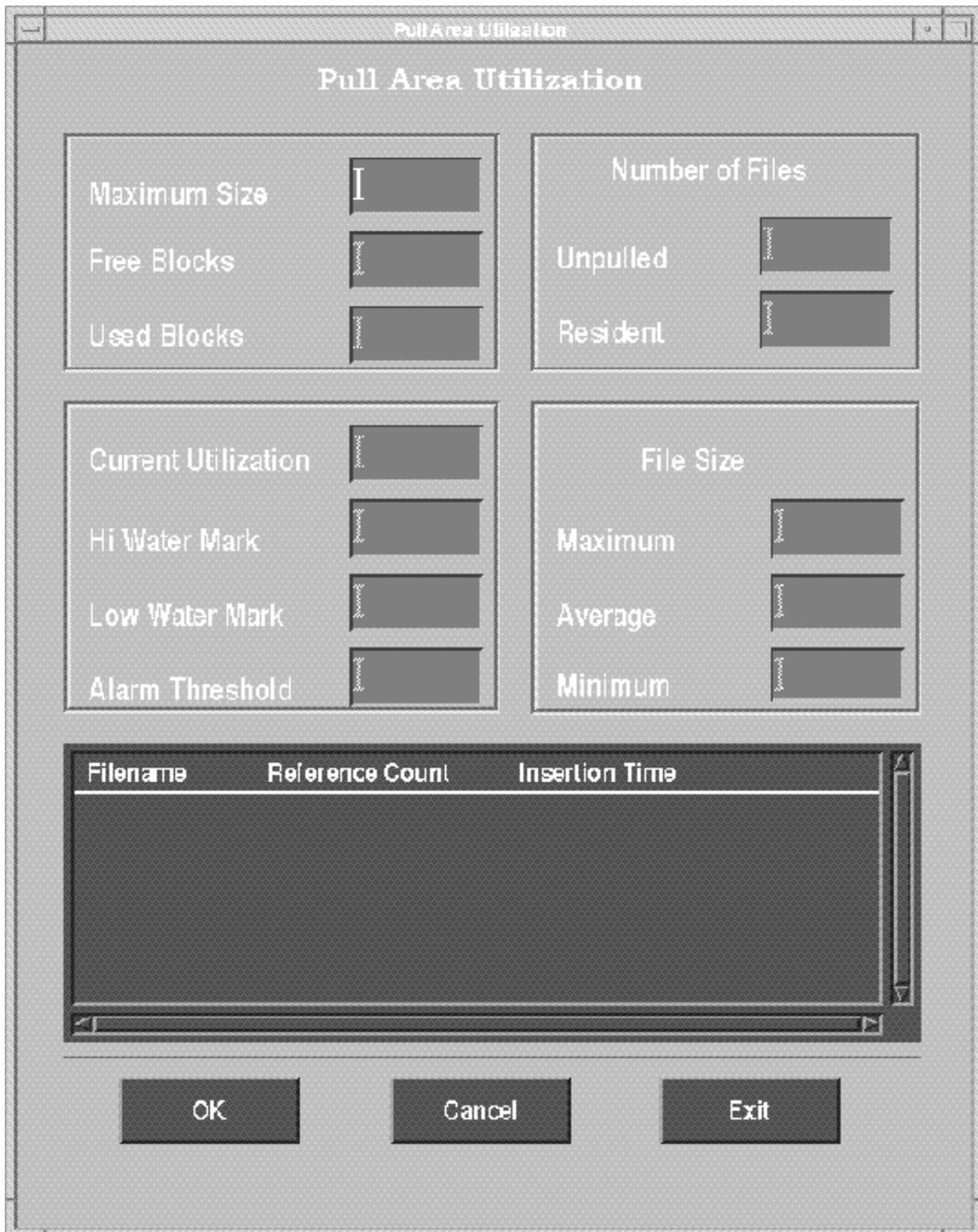
**Figure 3.11.5.6-1. DSS System Management - Other Screens - Logs and Reports (MSS)**



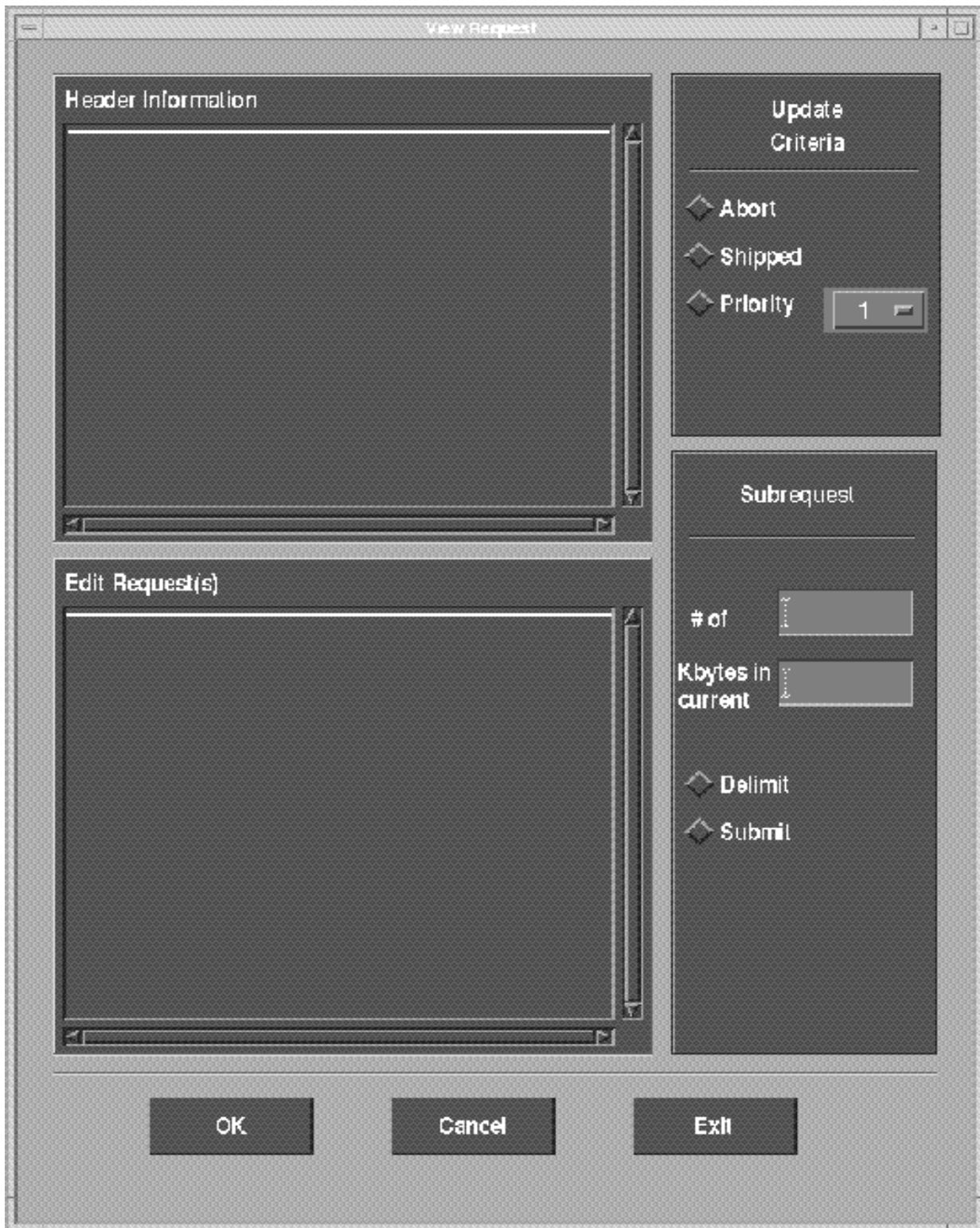
**Figure 3.11.5.6-2. Distribution Management (Home) - Requests**



**Figure 3.11.5.6-3. Storage Management - Main Menu**



**Figure 3.11.5.6-4. Storage Management - Pull Area Utilization**



**Figure 3.11.5.6-5. Distribution Management - View Request Screen**