

3.8 Resource Management and Control Activities

3.8.1 Data Processing Host Routine Maintenance Scenario

3.8.1.1 Scenario Description

This scenario describes the steps that are executed in performing routine maintenance on the Data Processing host. In this example, there are a variety of different ECS personnel involved. The definitions and roles of the participating staff members are taken from the Maintenance and Operations Manual for the ECS Project 607-CD-001-001) and/or The Maintenance and Operations Configuration Management Plan for the ECS Project. The personnel involved are, sustaining engineer, resource manager and host operator. In this scenario the PDPS Host at the Goddard DAAC will be taken off-line for routine maintenance. The Resource Manager, responsibilities include hardware, software, LAN and local DCE cell configuration, allocation and utilization performance in accordance with site and system approved resource baselines and schedules, provides plan and directs/implements system reconfiguration in response to operations anomalies, etc., notifies the affected operators that routine maintenance is scheduled and the PDPS host will be coming down for the maintenance. The resource manager then checks with the production monitor to begin "unloading" the target resources (if Autosys has already scheduled this event it will happen automatically). The Production Monitor then checks the current load on target resources and notices that there is still some processing going on. The Production Monitor then notifies the Resource Manager that there is some processing still going on and that it will be wrapping up within the next ten minutes. The production monitor ,once the processing has completed, informs the resource manager that the production jobs are complete. The Resource Manager then begins the shutdown process. Then by monitoring HP OpenView the Resource Manager and Sustaining Engineer are notified that the host has gone off-line. The computer operator then performs the routine maintenance and runs all diagnostic tests. The sustaining engineer then informs the resource manager that the upgrade has been completed. Resource Manager initiates the host startup commands. HP OpenView then indicates that the host is back on line.

3.8.1.2 Frequency

Routine Maintenance will occur once a month. However there will be other situations, in which the routine maintenance will be needed to resolve unplanned ground events.

3.8.1.3 Assumptions

The assumptions underlying this scenario are as follows:

1. The ground event (routine maintenance) is scheduled and the appropriate management and staff have agreed to it.
2. The Resource Manager printed out a copy of resource plan earlier in the day.
3. A copy of the schedule has been provided to all of the impacted operators/operations in advance.

4. All E-mail messages were created using Z-mail, the E-mail package that will be available to all M&O personnel in Release A.

3.8.1.4 Components

Figure 3.8.1.4-1 indicates the interaction between the DAAC personnel and the ECS subsystems.

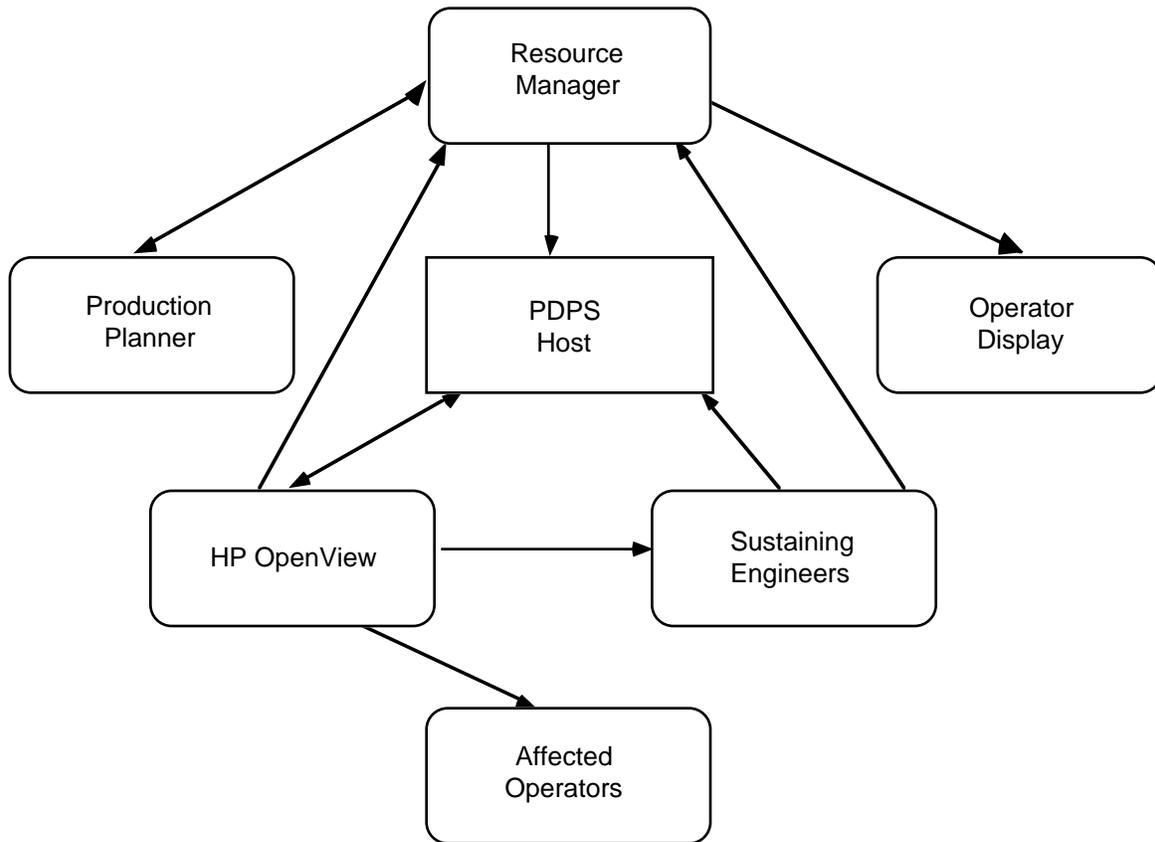


Figure 3.8.1.4-1. Data Processing Host Routine Maintenance Scenario

3.8.1.5 Preconditions

The following preconditions are assumed for this scenario.

1. The routine maintenance has been previously scheduled and that the resource manager has previously printed a copy of the resource plan.
2. The reconfiguration of resources to limit operational impact has been defined.

3.8.1.6 Detailed Steps of Process

Table 3.8.1.6-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.8.1.6-1. Data Processing Host Routine Maintenance Process (1 of 3)

Step	Duration	User	Operator Action	System	Figure
1	< 2 Time = 1100			System composes an information message to the affected operators stating that the PDPS Host will be taken down for routine maintenance at 1130.	3.8.1.6-9
2	< 1 Time = 1102			Displays information message on operator displays	3.8.1.6-1
3	3 Time = 1103			System asks the Production Monitor to verify that the production has been completed on the PDPS Host as scheduled	
4	1 Time = 1106		Production Monitor checks current load on target resources	Provides display of current jobs running on requested Production Resources	
5	3 Time = 1107		Production Monitor performs a "PS" unix command to verify that all processes have been completed		
6	<1 Time = 1110		Production Monitor notifies the Resource Manager that there are a few jobs still being processed and that they will be finishing up in the next 10 minutes. Based on past jobs the operators will have a good idea as to how long each job should take.	System sends pop up notification	3.8.1.6-9
7	<1 Time = 1111		Resource Manager receives pop up notification from the Production Monitor.	System receives pop up notification	3.8.1.6-2

Step	Duration	User	Operator Action	System	Figure
8	9 Time = 1112		Production Monitor continues to monitor the processing, in order to notify the Resource Manager as soon as the processing has completed.		
9	<1 Time = 1121			Processing finishes.	
10	< 1 Time = 1122		Production Monitor informs the Resource Manager that production jobs are complete!	System sends pop up notification	3.8.1.6-9
11	<1 Time = 1123		Resource Manager receives pop up notification from the Production Monitor.	System receives pop up notification	3.8.1.6-3
12	5 Time = 1124		Resource Manager begins shut down procedures to take the host off-line.	The host receives the command and goes off-line.	
13	<2 Time = 1129			HP OpenView detects the change and changes the state to off-line.	3.8.1.6-4
14	< 1 Time = 1131			HP OpenView sends a status message to all of the affected operators indicating that the host has gone down and changes the corresponding icon to the down state.	

15	< 3 Time = 1132	Sustaining Engineer receives a message from HP OpenView indicating that the desired host has gone off-line.	Resource Manager receives a message from HP OpenView indicating that the desired host has gone off-line. All operators monitoring the host receive a message from HP OpenView indicating that the desired host has gone off-line.	System receives pop up message.	3.8.1.6-5
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Step	Duration	User	Operator Action	System	Figure
16	25 Time = 1135		Computer Operator performs routine maintenance of PDPS host.		
17	10 Time = 1200	Sustaining Engineer runs all of the diagnostic tests to verify that upon completion of the routine maintenance the PDPS Host is functioning as expected.		System executes diagnostic tests	
18	< 1 Time = 1210	Sustaining Engineer informs the resource manager that the maintenance is completed		System sends pop up notification.	3.8.1.6-9
19	< 1 Time = 1211		Resource Manager receives a message from the sustaining engineer that the routine maintenance has been successfully completed.	System receives pop up notification	3.8.1.6-6
20	< 1 Time = 1212		Resource Manager initiates the host startup commands.	Host receives commands and begins to startup.	
21	5 Time 3 1214			Startup complete	
22	< 2 Time = 1218			HP OpenView detects the state change ==> changes the PDPS icon to the up status and sends a status message to all users indicating that the host is back on line.	3.8.1.6-7

23	< 1 Time = 1220	Sustaining Engineer receives message from HP OpenView indicating that the host is back on line.	Resource Manager receives message from HP OpenView indicating that the host is back on line. All operators monitoring the affected host receive a message from HP OpenView indicating that the host is back on line		3.8.1.6-8
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3.8.1.7 Postconditions

The routine maintenance has completed and control is put back to the production monitor.

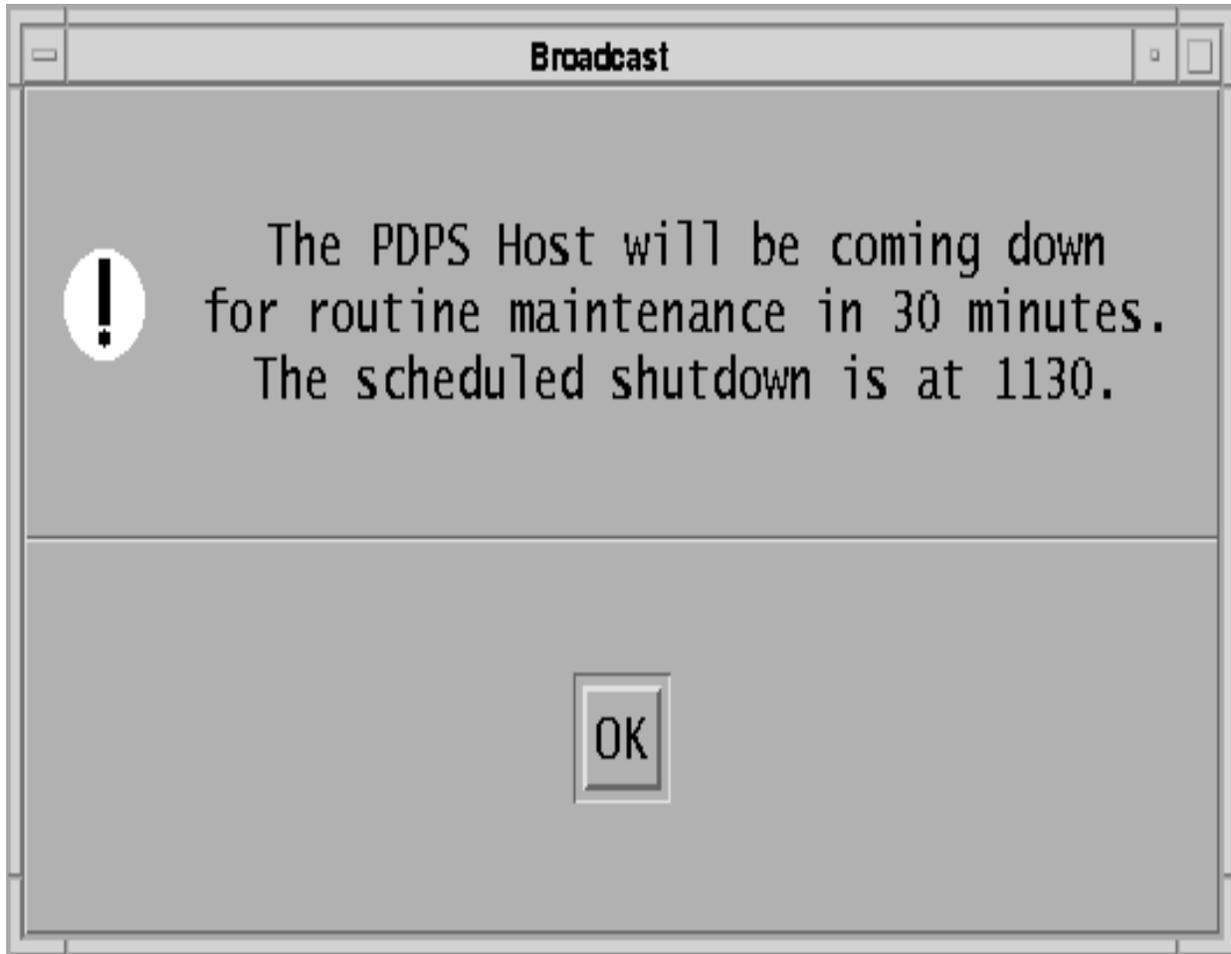


Figure 3.8.1.6-1. Broadcast Message 1-

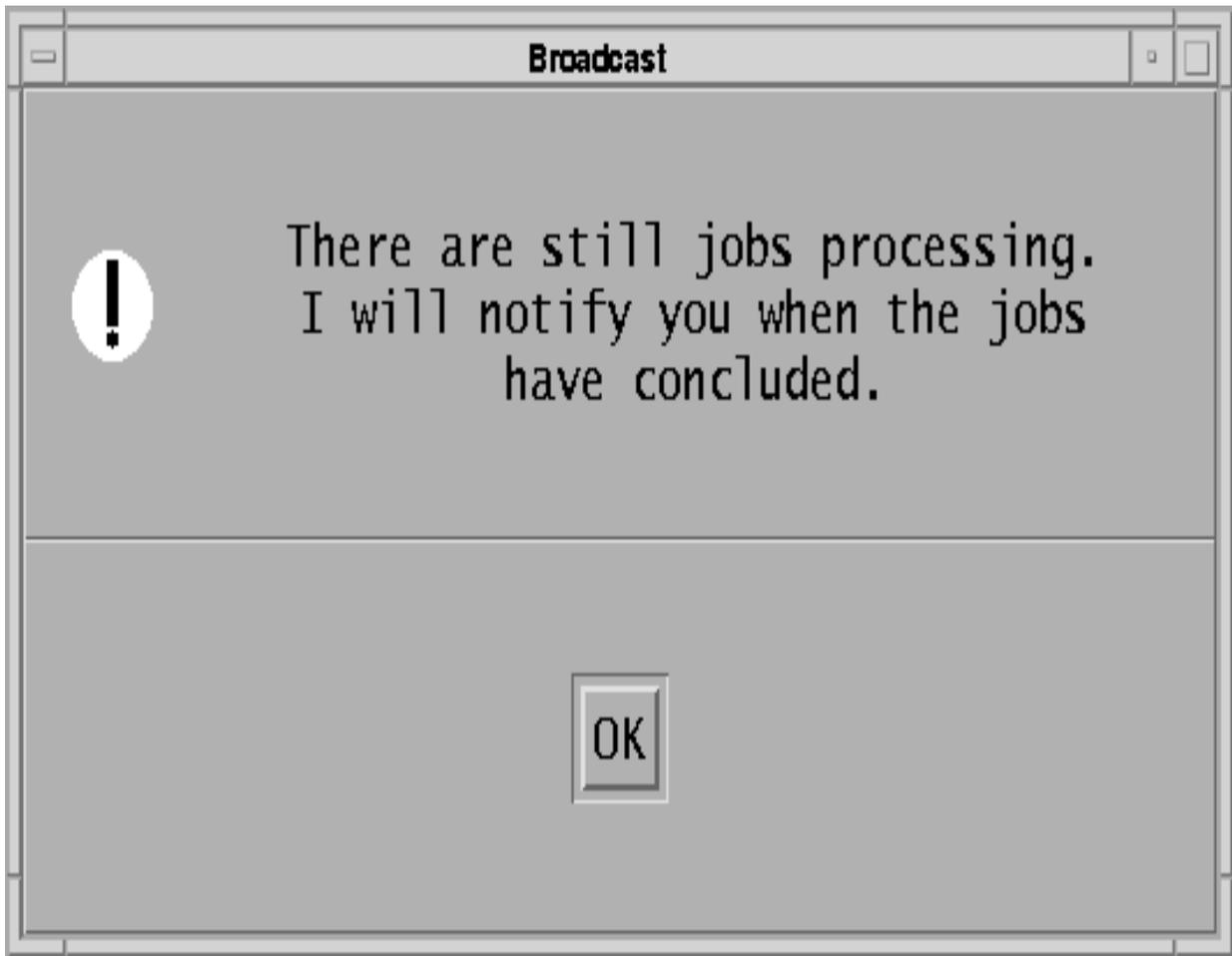


Figure 3.8.1.6-2. Broadcast Message 2

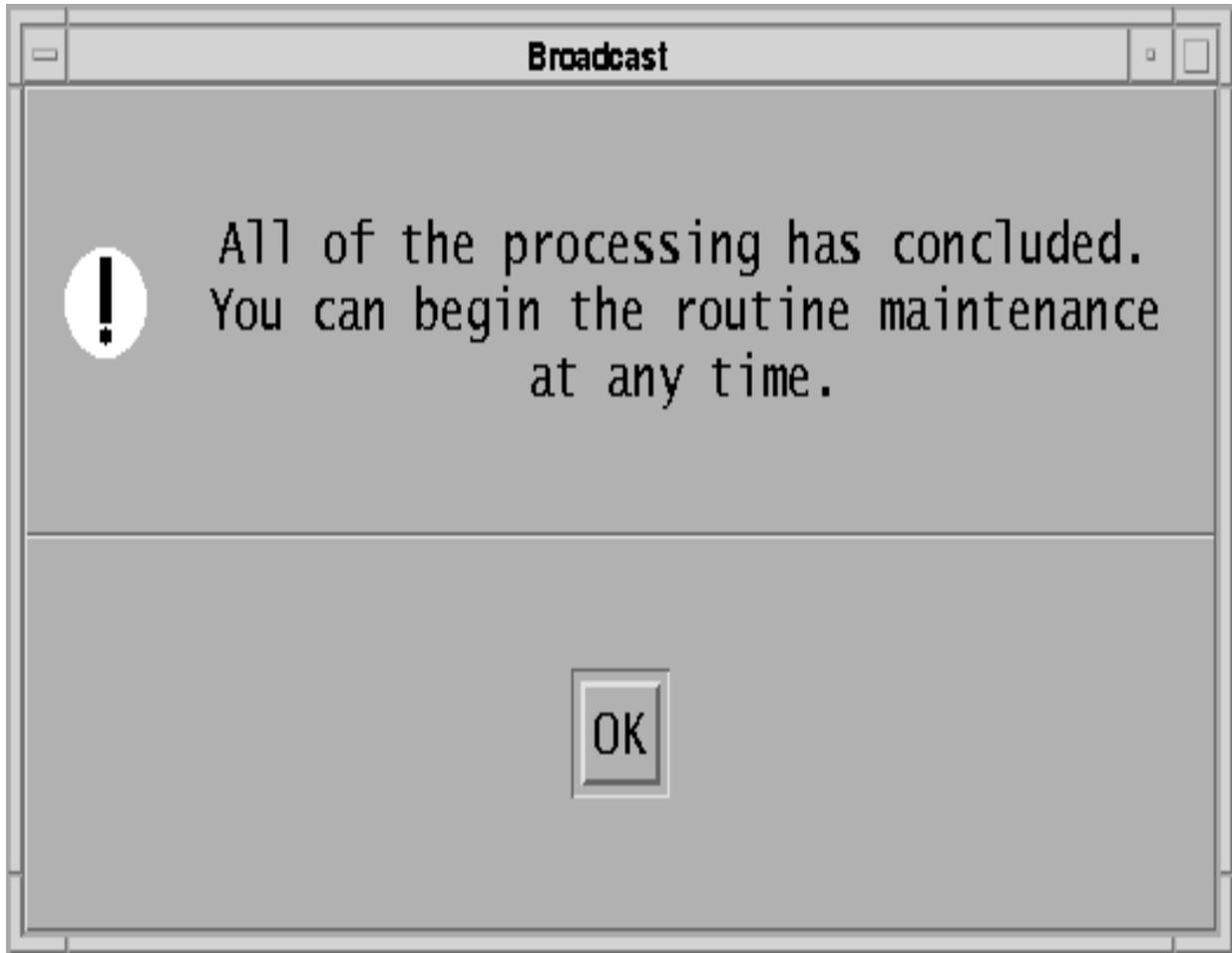


Figure 3.8.1.6-3. Broadcast Message 3

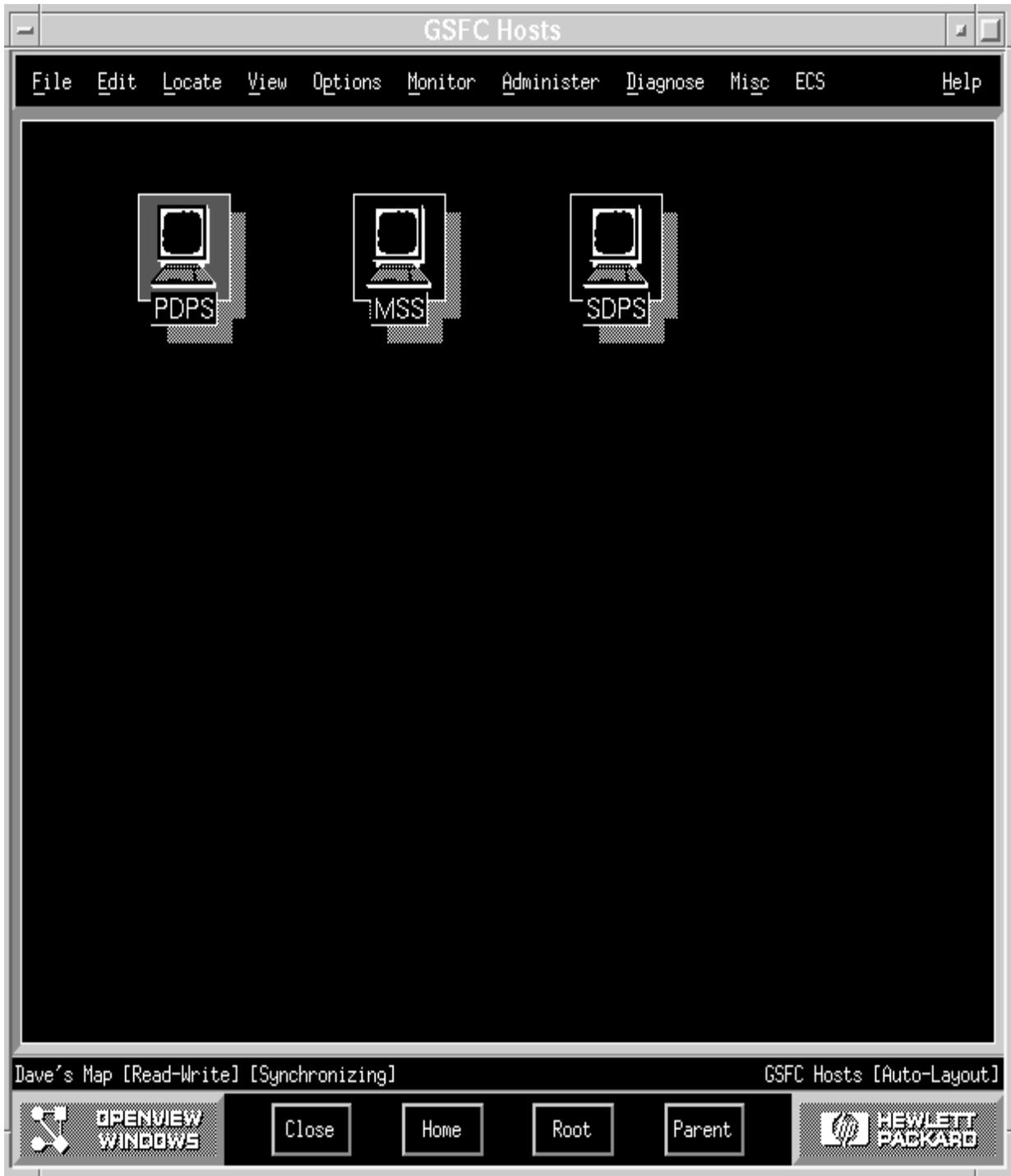


Figure 3.8.1.6-4. HP OpenView GSFC Hosts Map

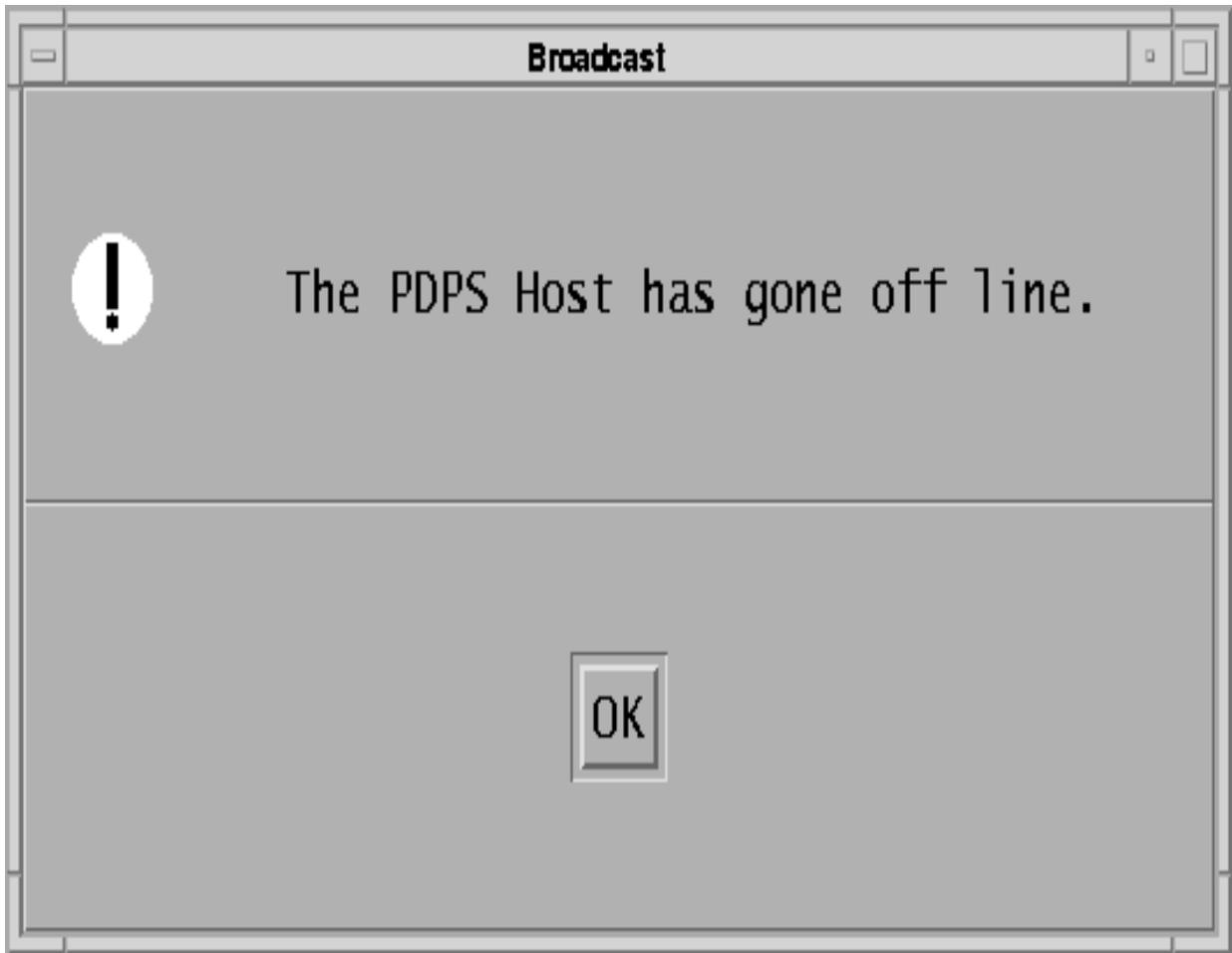


Figure 3.8.1.6-5.Broadcast Message 4

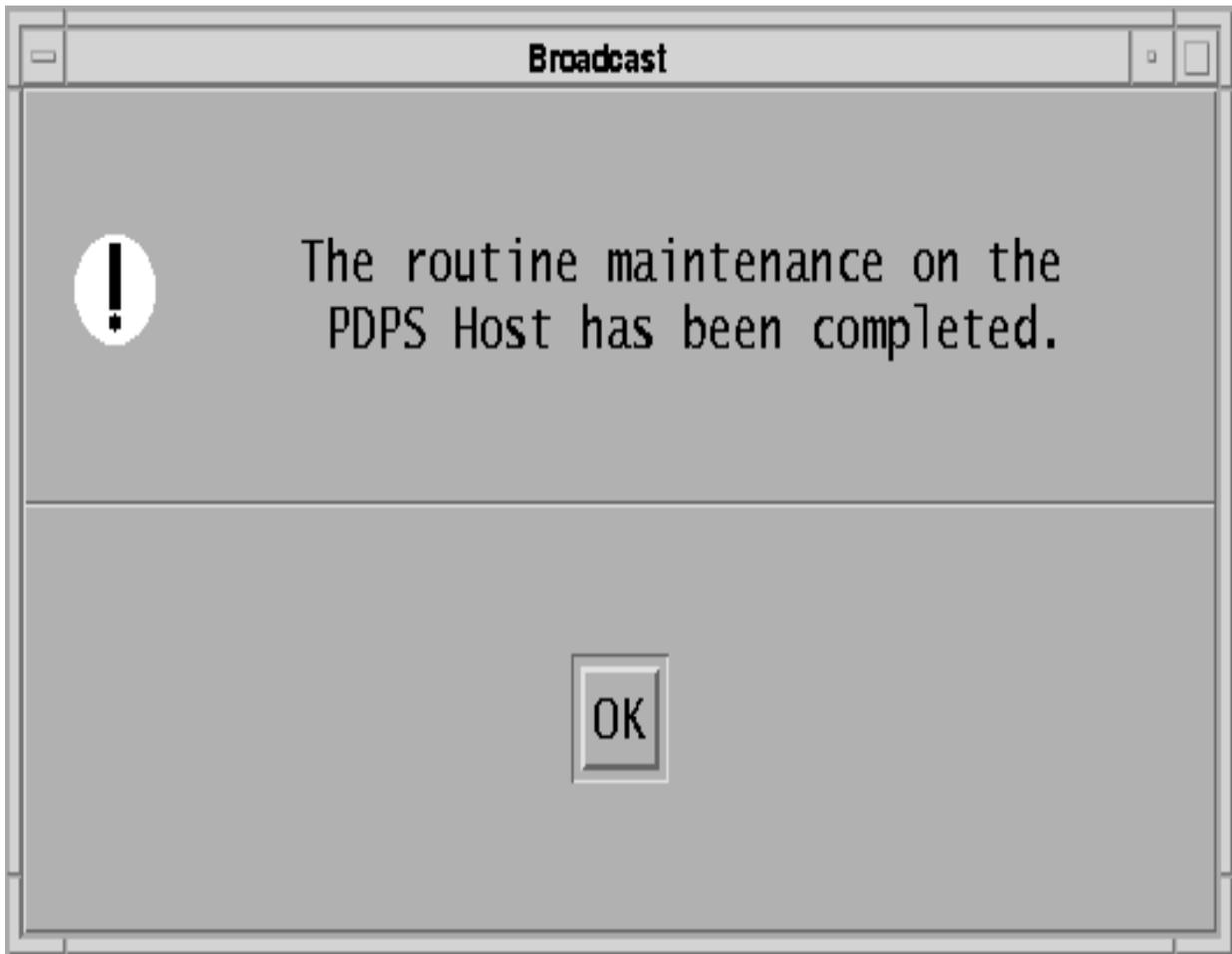


Figure 3.8.1.6-6. Broadcast Message 5

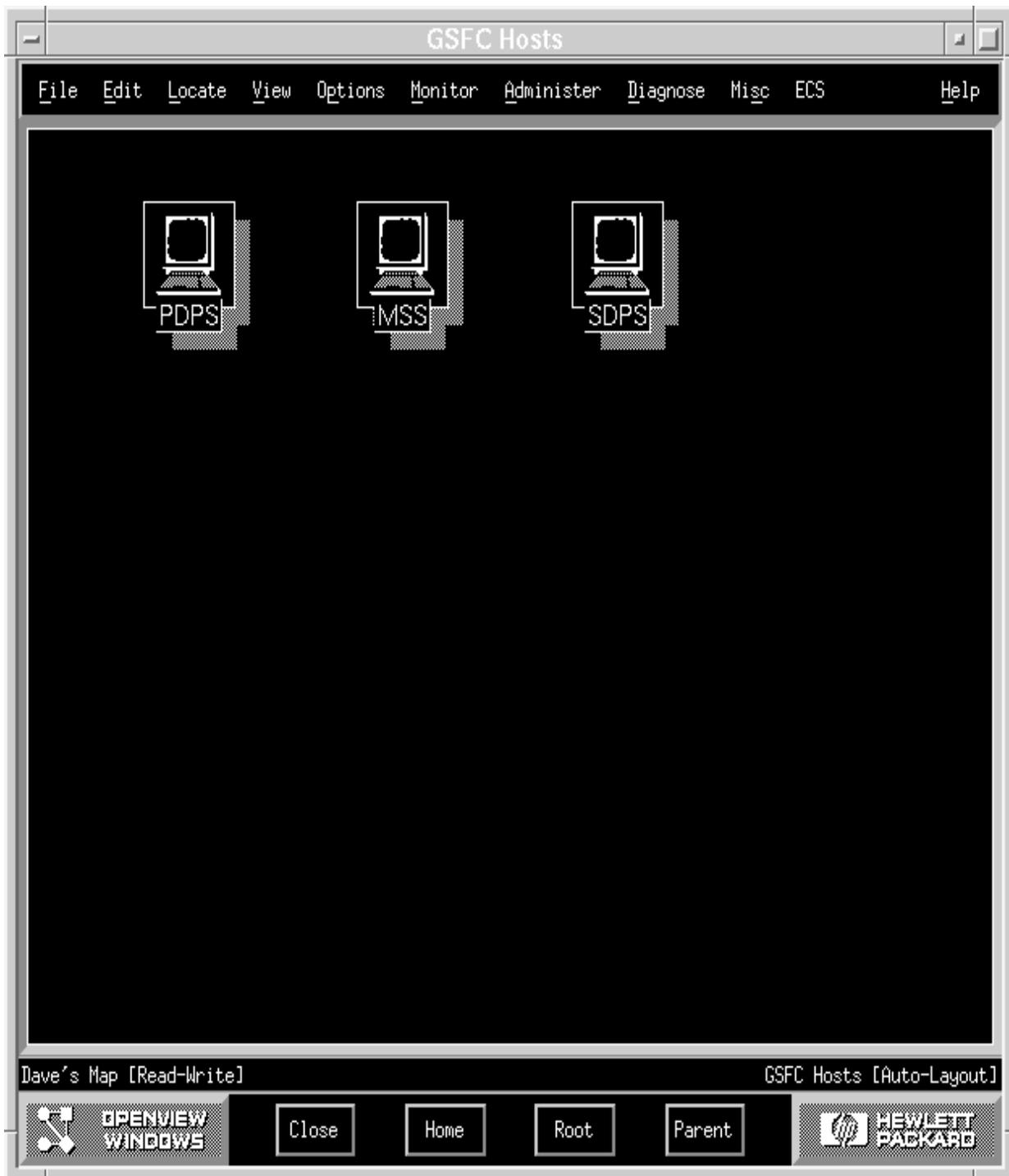


Figure 3.8.1.6-7. HP OpenView GSFC Hosts Map

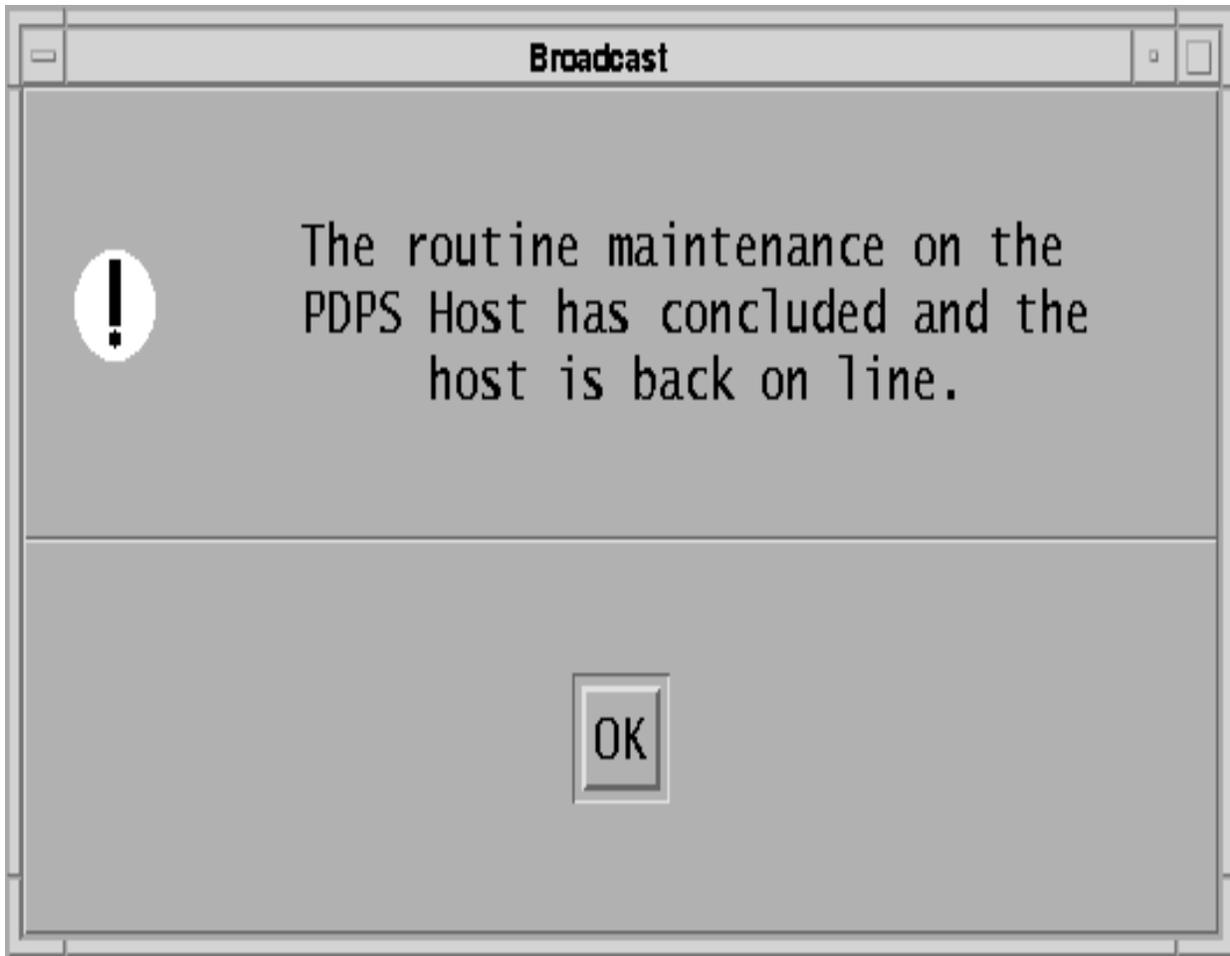


Figure 3.8.1.6-8. Broadcast Message 6

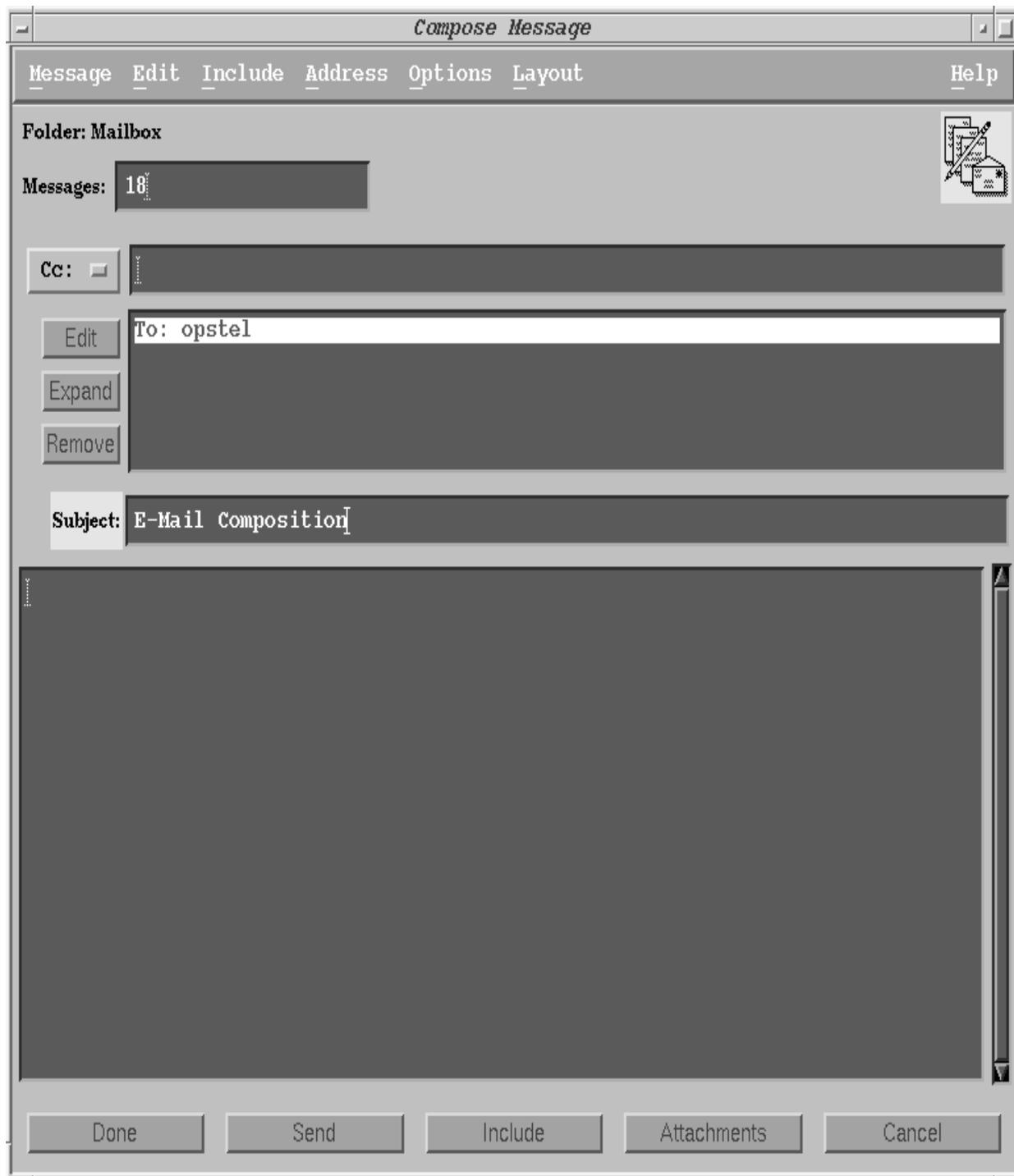


Figure 3.8.1.6-9. E-Mail Composition

3.8.2 Installation of Software Upgrade Scenario

3.8.2.1 Scenario Description

This scenario describes the steps that are executed to perform a COTS software upgrade on an ECS host. In this example, there are a variety of different ECS personnel involved. The definitions and roles of the participating staff members are taken from the Maintenance and Operations Manual for the ECS Project 607-CD-001-001) and/or The Maintenance and Operations Configuration Management Plan for the ECS Project. The personnel involved are, a sustaining engineer, resource manager and host operator. In this scenario there will be a COTS upgrade at the GSFC DAAC. The Resource Manager, responsibilities include hardware, software, LAN and local DCE cell configuration, allocation and utilization performance in accordance with site and system approved resource baselines and schedules, provides plan and directs/implements system reconfiguration in response to operations anomalies, etc., notifies the affected operators that there is an upgrade scheduled and the resources will be coming down for the upgrade. The resource manager then checks with the production monitor to begin "unloading" the target resources (if Autosys has already scheduled this event it will happen automatically). The Production Monitor then checks the current load on target resources and informs the resource manager that the production jobs are complete. The Resource Manager then takes the initiative to shut down any processes that may still be running and begins shut down procedures. Then by monitoring HP OpenView the Resource Manager and Sustaining Engineer are notified that the host has gone off-line. Sustaining Engineer uses the install script to install the upgrade, verifies the path and directory structures and runs all diagnostic tests. The sustaining engineer then informs the resource manager that the upgrade has been completed. Resource Manager initiates the host startup commands. HP OpenView then indicates that the host is back on line.

3.8.2.2 Frequency

Whenever it is determined that a software upgrade is needed. We estimate that during the early days of a release the time frame will be much more frequent (approximately once every two weeks). As the release matures we would expect the time frame to grow to maybe four to six times per year.

3.8.2.3 Assumptions

The assumptions underlying this scenario are as follows:

1. The upgrade is scheduled and the appropriate management and staff have agreed to it.
2. The software upgrade has been previously tested by the acceptance test organization and has been moved to the configuration management directories at the DAACs.
3. The Sustaining Engineer will have the proper permissions needed to execute the install of the software upgrade.
4. The sustaining Engineer will be provided a script to load the upgrade.
5. The Resource Manager printed out a copy of resource plan earlier in the day.

6. A copy of the schedule has been provided to all of the impacted operators/operations in advance.
7. All E-mail messages were created using Z-mail, the E-mail package that will be provided to all M&O personnel in Release A.
8. The upgrade has been tested offline prior to the scheduled installation. The upgrade has been integrated offline at the mini DAAC and there were no adverse conditions recorded with the other software on the system.
9. A system backup is taken prior to the initialization of any upgrade.

3.8.2.4 Components

Figure 3.8.2.4-1 indicates the interaction between the DAAC personnel and the ECS subsystems.

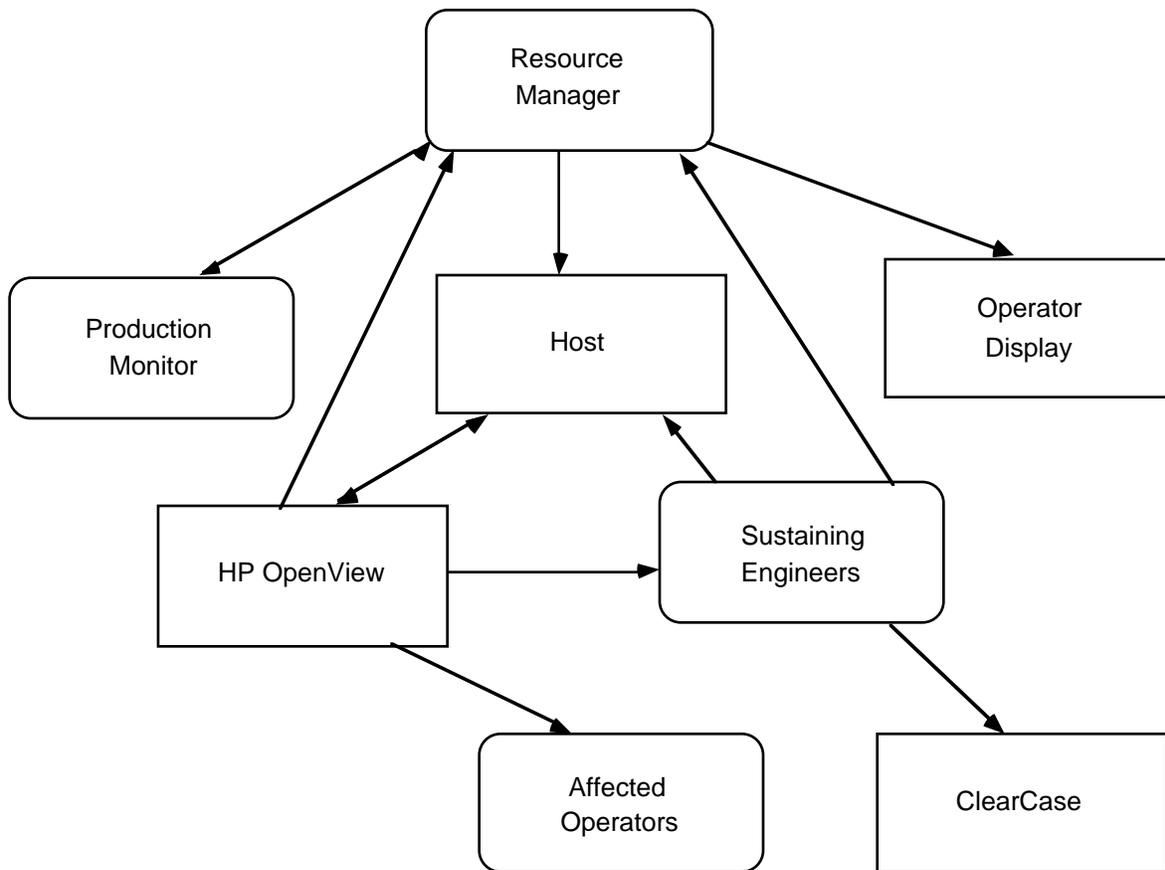


Figure 3.8.2.4-1. Installation of Software Upgrade Components

3.8.2.5 Preconditions

The following preconditions are assumed for this scenario.

1. The upgrade has been previously scheduled and that the resource manager has previously printed a copy of the resource plan.
2. The software upgrade package, including any associated install script/makefile, is in ClearCase at the site.
3. The upgrade is already at the DAAC, in the CM package, and detailed steps for completing the upgrade have been provided.
4. The reconfiguration of resources to limit operational impact has been defined.

3.8.2.6 Detailed Steps of Process

Table 3.8.2.6-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.8.2.6-1. Installation of Software Upgrade Process (1 of 3)

Step	Duration	User	Operator Action	System	Figure
1	< 2 Time = 0800			System composes an information message to the affected operators stating that the affected resource will be taken down for PM at 1400.	3.8.2.6-3
2	< 1			Displays information message on operator displays	3.8.2.6-1
3	3 Time = 1345		Resource Manager asks the production monitor to verify that the production has completed on the resource as planned	System asks the Production Monitor to verify that the production has been completed on the resource as planned.	
4	1 Time = 1350		Production Monitor checks current load on target resources	Provides display of current jobs running on requested Production Resources	
5	< 1 Time = 1351		Production Monitor informs the Resource Manager that production jobs are complete!		
6	< 2 Time = 1353		Resource Manager now takes control and shuts down any processes still running on the impacted host(s)		
7	5 Time = 1358		Resource Manager begins shut down procedures to take the host off-line.	The host receives the command and goes off-line.	
8	<2 Time = 1400			HP OpenView detects the change and changes the state to off-line.	3.8.2.6-2
9	< 1 Time = 1401			HP OpenView sends a status message to all of the affected operators indicating that the host has gone down and changes the corresponding icon to the down state.	3.8.2.6-3

Step	Duration	User	Operator Action	System	Figure
10	< 3 Time = 1404	.	Resource Manager receives a message from HP OpenView indicating that the desired host has gone off-line. All operators monitoring the host receive a message from HP OpenView indicating that the desired host has gone off-line. Sustaining Engineer receives a message from HP OpenView indicating that the desired host has gone off line.		3.8.2.6-2
11	< 1 Time = 1405		Resource Manager views the change in HP OpenView and notifies the sustaining Engineer that the host is now available for upgrade.		3.8.2.6-2
12	<3 Time = 1408		Sustaining Engineer uses the developer's install script stored in ClearCase (COTS CM Tool)	ClearCase executes the named install script, which applies controlled, file system changes to the specified host.	
13	< 5 Time = 1413		Sustaining Engineer verifies that all of the paths and directories structures have been created and are correct.	Host lists its file system contents	
14	10 Time = 1423		Sustaining Engineer runs all of the diagnostic tests to verify that the new upgrade is operating as expected.		
15	< 1 Time = 1424		Sustaining Engineer informs the resource manager that the upgrade is completed		
16	< 1 Time = 1425		Resource Manager receives a message from the sustaining engineer that the upgrade has been successfully completed.		
17	< 1 Time = 1426		Resource Manager initiates the host startup commands.	Host receives commands and begins to startup.	

18	5 Time = 1431			Startup complete	
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Step	Duration	User	Operator Action	System	Figure
19	< 2 Time = 1433			HP OpenView detects the state change ==> changes the icon to the up status and sends a status message to all users indicating that the host is back on line.	3.8.2.6-2
20	< 1 Time = 1434		Resource Manager receives message from HP OpenView indicating that the host is back on line. All operators monitoring the affected host receive a message from HP OpenView indicating that the host is back on line. Sustaining Engineer receives message from HP OpenView indicating that the host is back on line.		3.8.2.6-2

3.8.2.7 Postconditions

The upgraded software is up and running and control is put back to the production monitor.

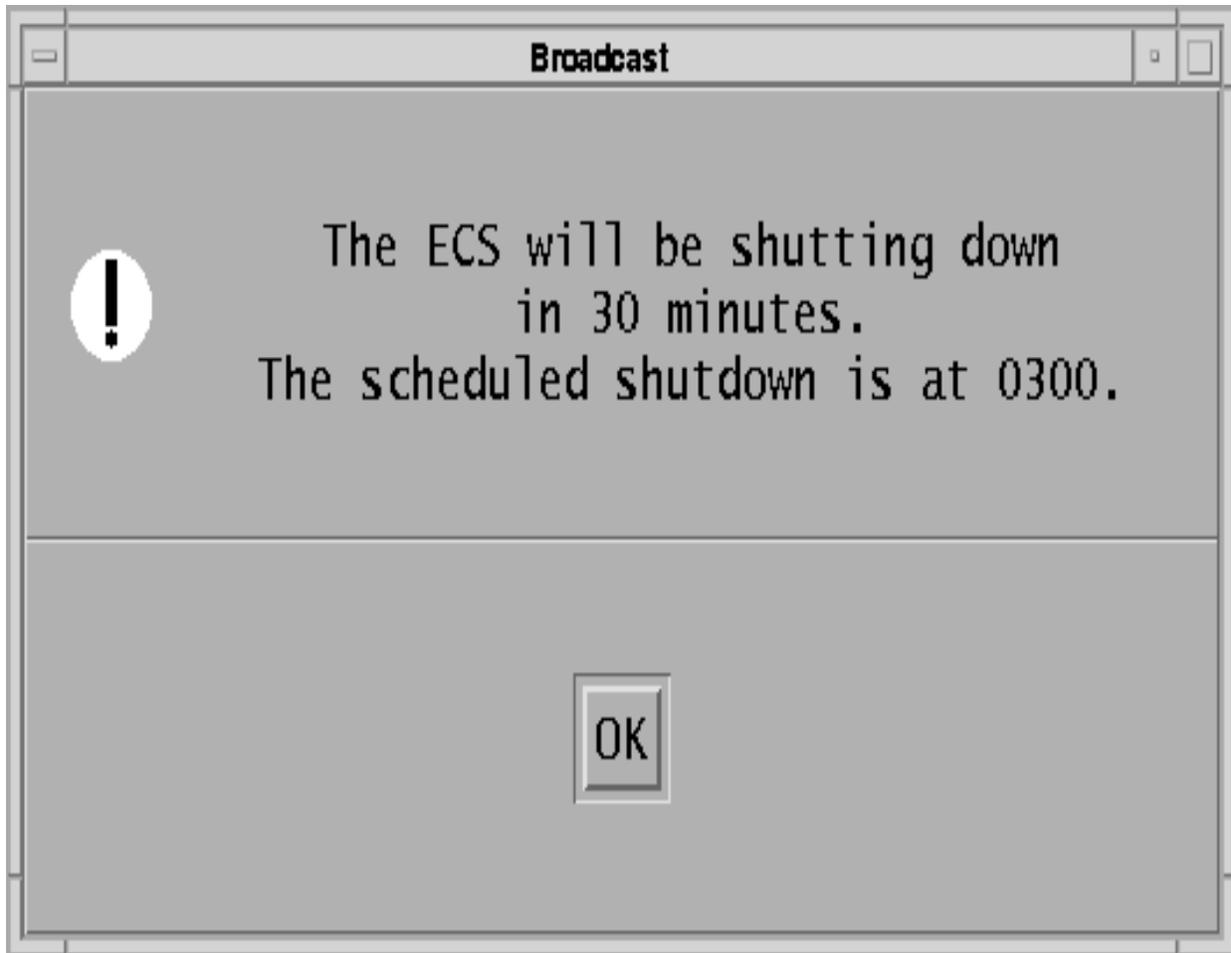


Figure 3.8.2.6-1. Broadcast Message 1-

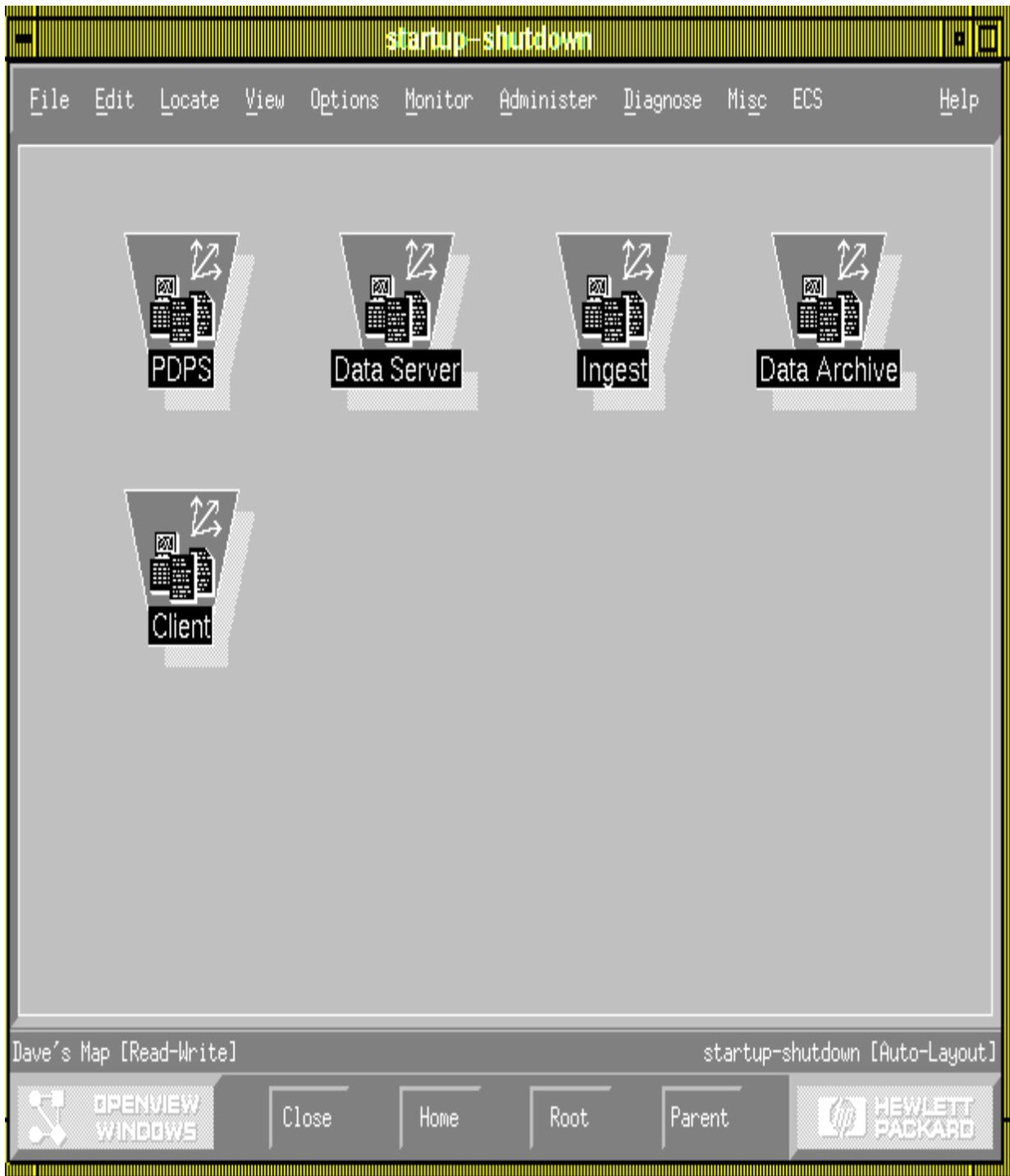


Figure 3.8.2.6-2. HP OpenView Startup-Shutdown Map



Figure 3.8.2.6-3. E-Mail Compositions