

Everything you wanted to know about (HP) OpenVMS Service Control – *but were afraid to ask !*

<http://www.openservicecontrol.org/>

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Agenda

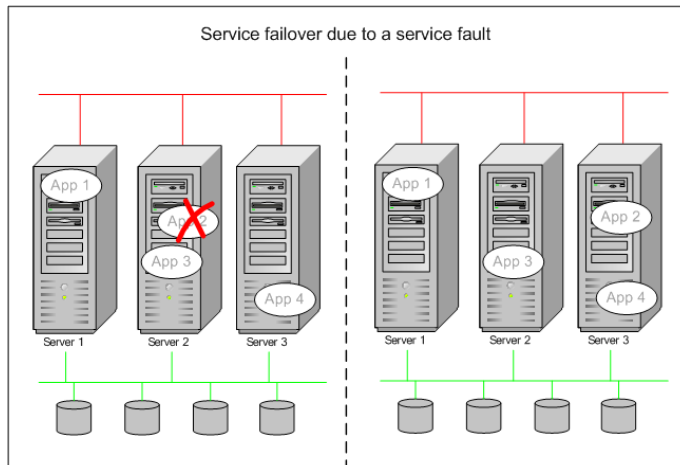
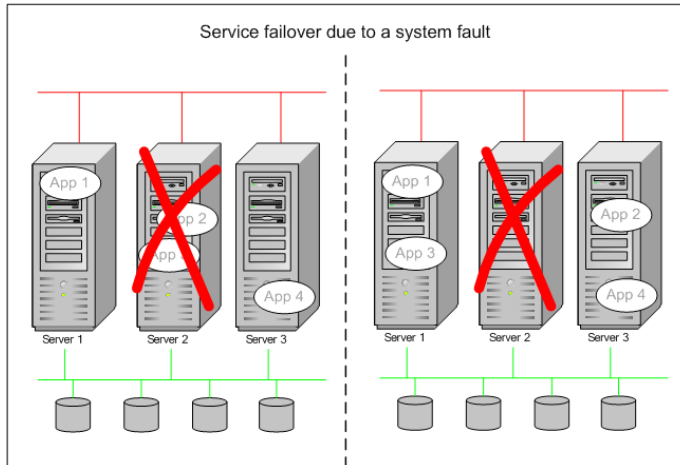
- Introduction
- Requirements
- Basic Concepts and Terminology
- OSC Components
 - Installation
 - Configuration
 - Management

Introduction

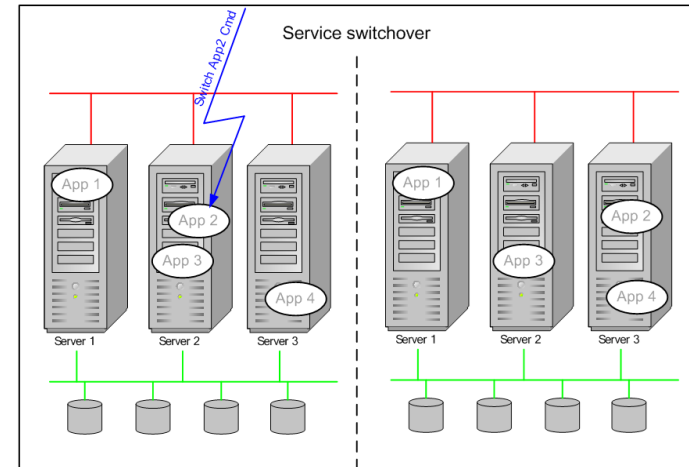
- HP **O**penVMS **S**ervice**C**ontrol (**OSC**) is a management framework that makes non-cluster aware services (applications) highly available to their clients.

Basic Functionality

- Failover



- Switchover



Requirements

- Monitor the health of a service
 - Application plus all its required hardware and software resources (disks, shadow sets, network interfaces ...)
- Relocate services due to service or system failures
- Service switchover on user request
- Able to handle any kind of application
 - Easily extendable
 - Reuseability of exiting Management scripts (Startup, Shutdown, Monitor Scripts)
- Easy to configure and control
- Event notification
 - Ordered by occurrence
 - Freely definable event notification method

Requirements (contd.)

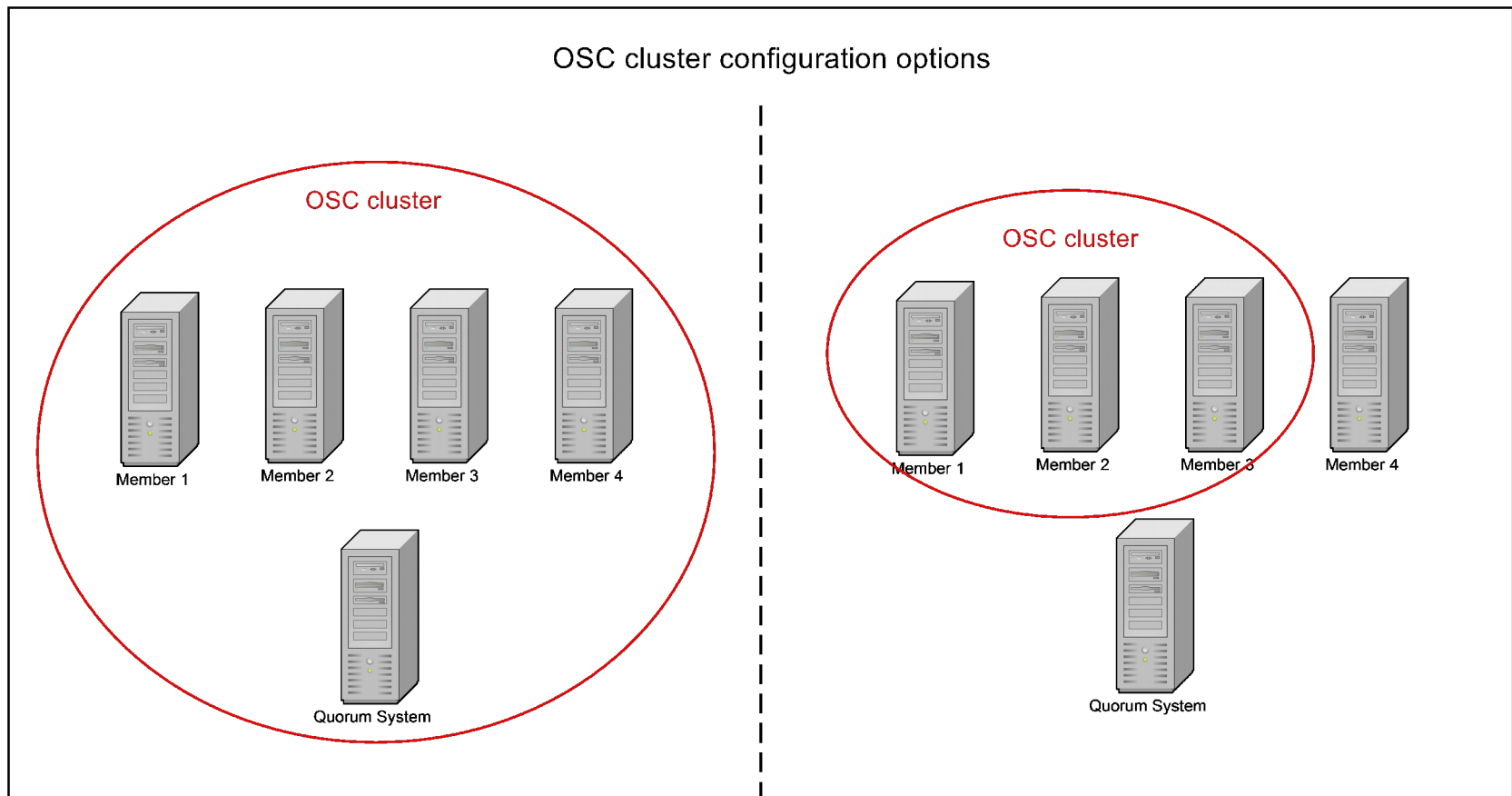
- Common management interface
- Common configuration interface
- Terminology and management interfaces similar to VERITAS™ cluster server (VCS)
- Wide range of control attributes to adjust OSC behavior to customer needs

Basic Concepts and Terminology

- OSC cluster
- OSC management entities (building blocks)
 - Resource
 - Service
 - Service Group

What is an OSC cluster?

- Consists of all or a subset of OpenVMS cluster members



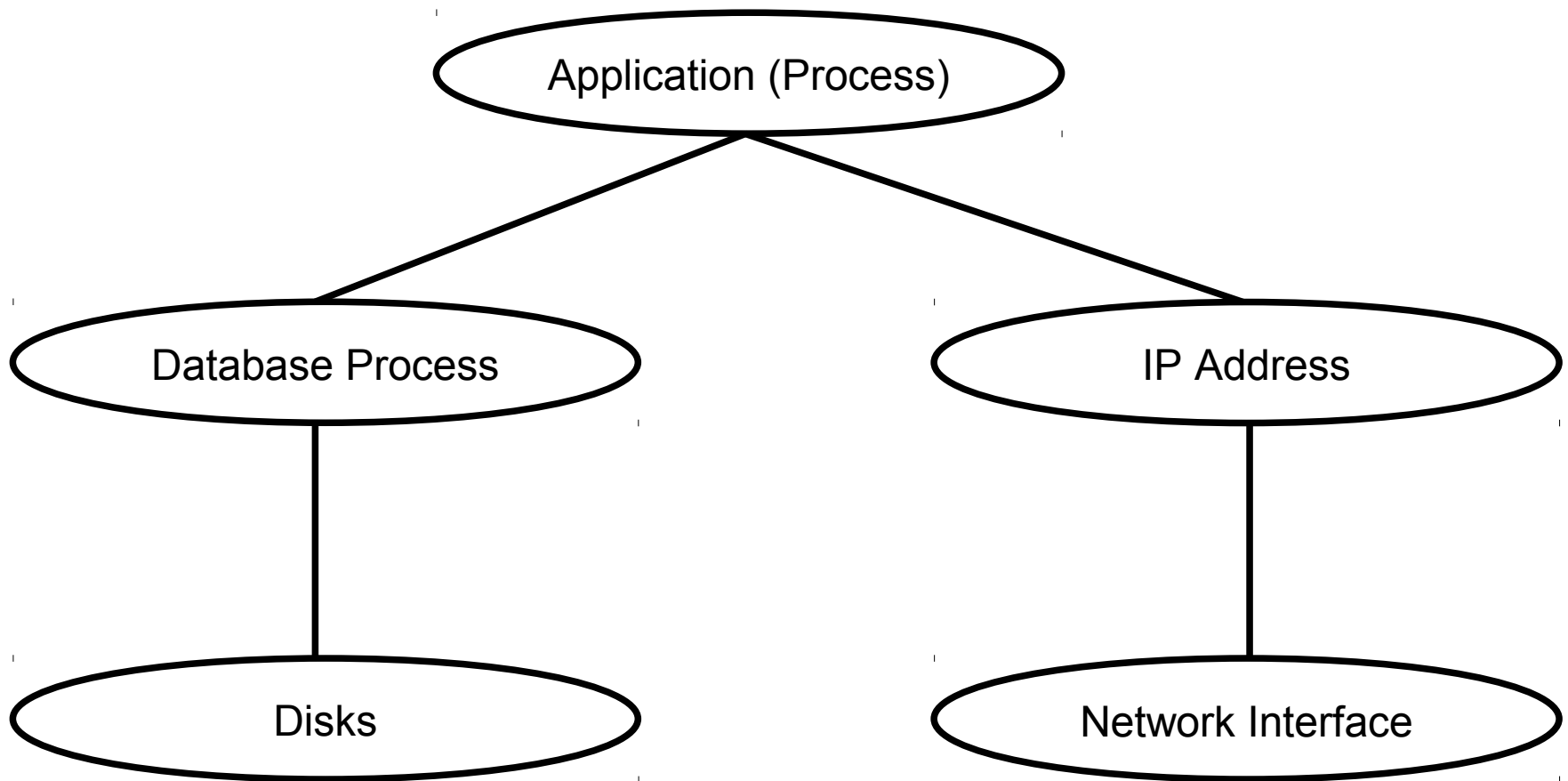
OSC Cluster

- OSC cluster members have to be defined when OSC is configured
 - Votes have to be assigned to each OSC cluster member
 - Quorum calculation (done the same way as OpenVMS cluster)
 - OSC quorum is different from OpenVMS quorum
 - As long as the OSC cluster has quorum the system resources of all remaining OSC cluster members are sufficient to run all managed applications
 - When OSC quorum is lost due to a node failure:
 - Applications that have been online on the failing node are not automatically started on the remaining OSC cluster member, since an OSC quorum lost state signals that overall system resources are not sufficient to run all managed applications
 - OSC blocks interactive management commands except:
 - SHOW and ADJUST QUORUM commands

Resources (RES)

- Resources are hardware and software entities such as:
 - Disks
 - Shadow Sets
 - Network Interface Cards
 - IP Addresses
 - Databases
 - Applications
 - ...
- Resource dependencies define the order in which resources are brought online or taken offline
 - Child resources must be online before a parent resource can be started
 - Parent resources have to be offline before a child resource can be shutdown

Resource Dependency Example



Resource Criteria

- An OSC resource is whatever you define as a resource
- Nevertheless, an OSC resource has to fulfill criteria in order to be managed by OSC
 - An OSC resource must be capable of being explicitly started by a set of commands
 - Startup of one OSC resource must not implicitly start other OSC resources. If so, these resources cannot be defined as independent OSC resources.
 - Each instance of a resource type (eg. database) must be capable of being stopped without affecting other instances of that resource type.

Resource Criteria

- An OSC resource must be capable of being explicitly stopped, by forcible means if necessary.
 - Shutdown of one OSC resource must not implicitly stop other OSC resources. If so, these resources cannot be defined as independent OSC resources.
- OSC resources must be capable of being monitored.
- OSC resources must be crash tolerant.
 - An OSC resource runs on a node that crashes -> OSC resource will start on a failover node in a none state (i.e. no memory content required to start the resource)
- OSC resources must be host independent within an OpenVMS cluster.
- No license restrictions or host name dependencies that prevents successful failover.

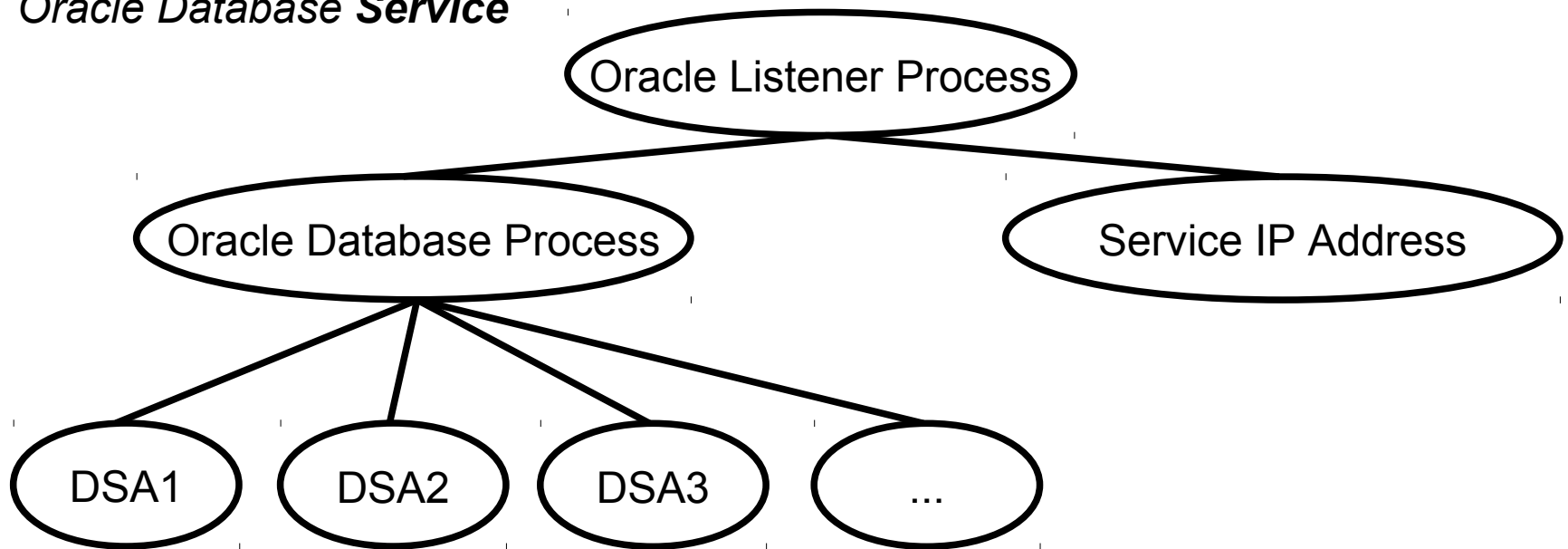
Resource Categories

- *On-Off*
 - Monitored
 - Started if required
 - Stopped if required
 - *Eg.*
 - Process
- *On-Only*
 - Monitored
 - Started if required
 - *Eg.*
 - Shadow Set
- *Persistent*
 - Monitored only
 - *Eg.*
 - Network Interface Card

Service (SER)

- A service is a logical grouping of resources and resource dependencies that are required to run a dedicated service (application). It is the management unit that controls resource sets .

Oracle Database Service

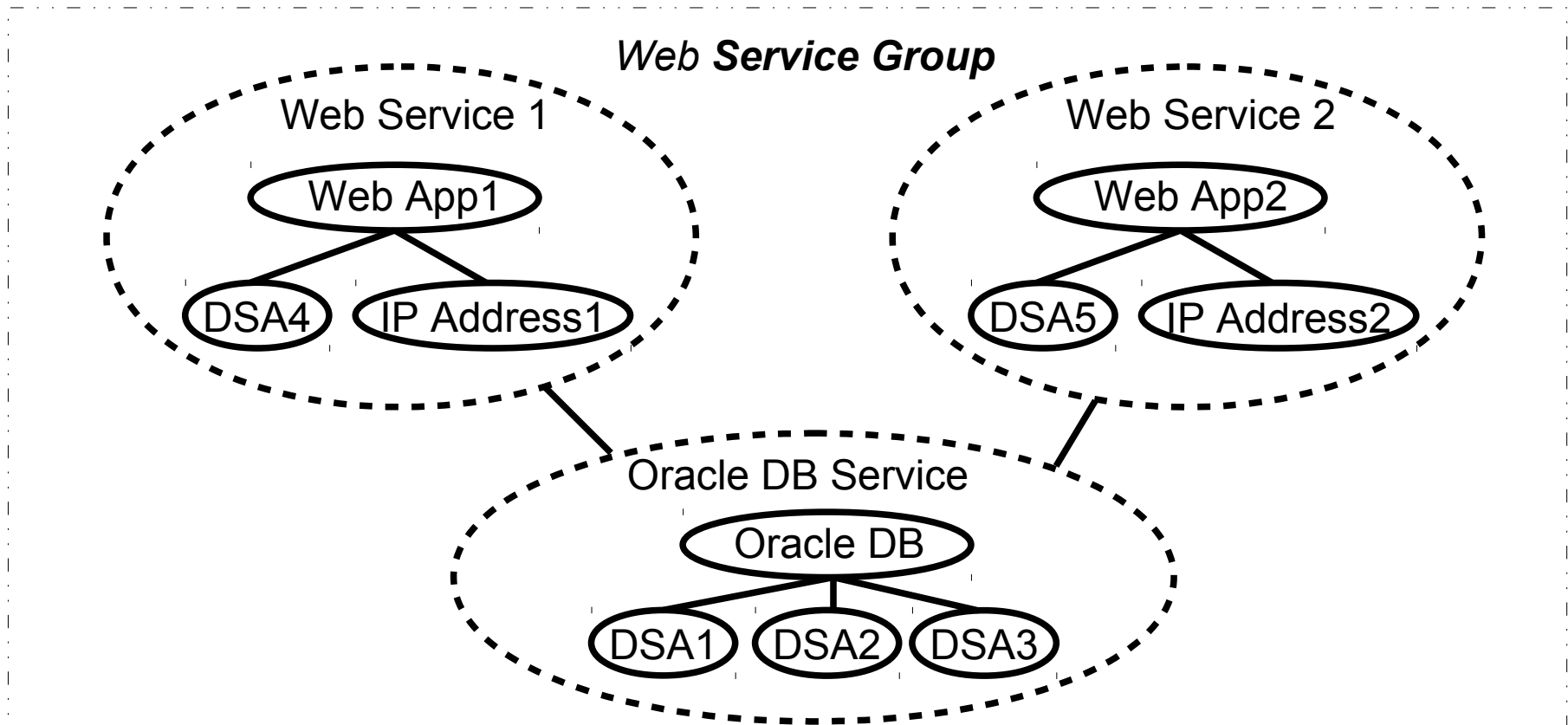


Service Dependency

- Service dependencies define the order in which services are brought online or taken offline
 - Child Services must be online before a Parent Service can be started.
 - Parent Services have to be offline before a Child Service can be shutdown.

Service Group (SRVGRP)

- A *service group* is a logical grouping of *services* and service dependencies.
- It is the OSC management and failover entity.



Service Group (SRVGRP)

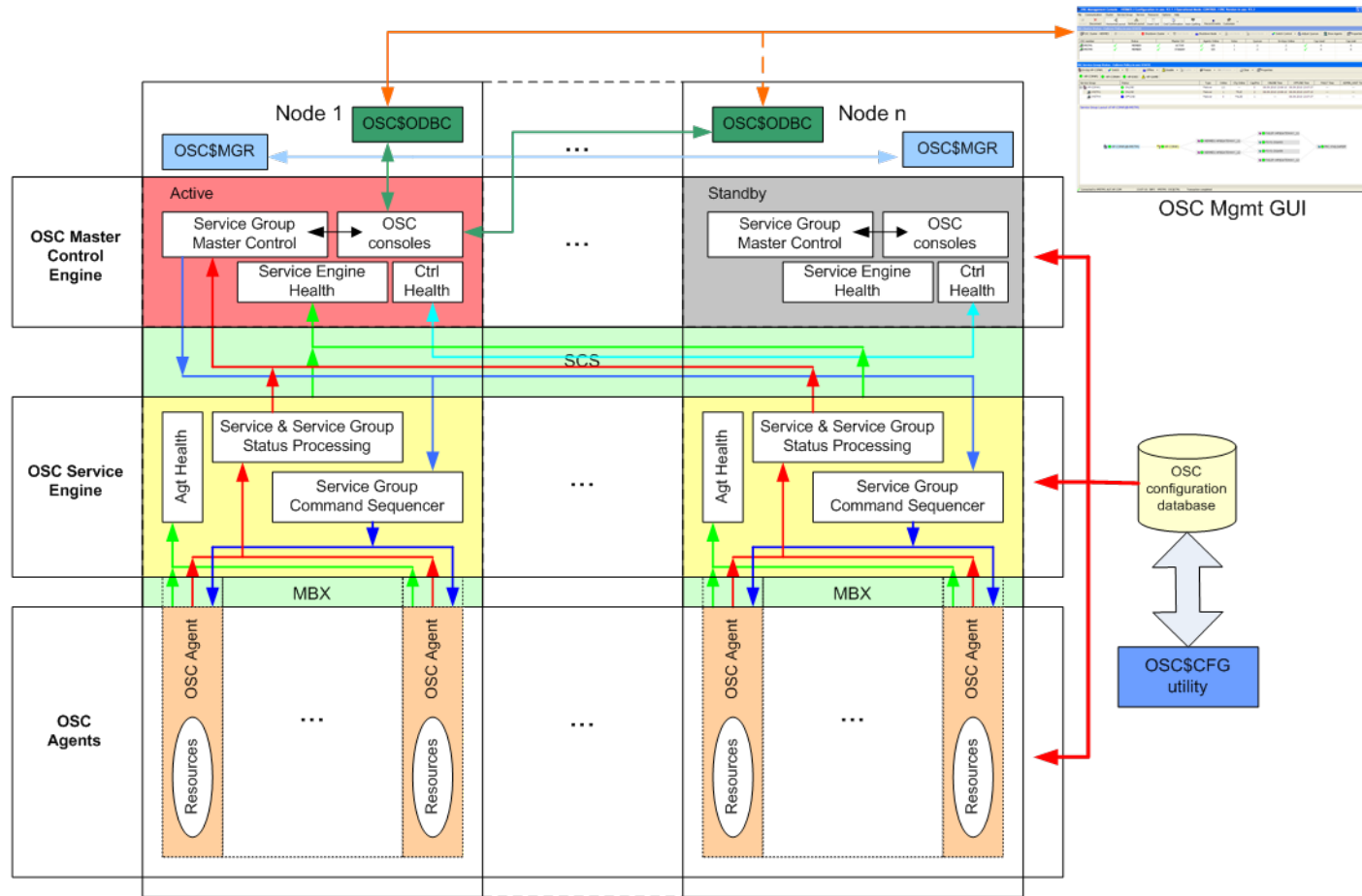
- Service Group Categories
 - Failover
 - A failover service group runs on one system in the OSC cluster at any time. Failover groups are used for non OpenVMS cluster aware applications (ie. applications that are not designed to maintain data consistency when multiple copies are started).
 - Multi-Instance
 - A Multi-Instance service group is active concurrently on more than one, but not on all systems within the OSC cluster. All services within the service group must be cluster aware.
 - Parallel
 - A parallel service group runs concurrently on all OSC cluster members. All services within the service group must be cluster aware.

Execution node list and priority has to be defined for each service group

OSC components

- OSC Agents
- OSC Service Engine
- OSC Master Engine
- OSC Management Utility
- OSC Configuration Utility
- OSC Configuration Database
- OSC Event Notification Service

OSC software architecture



OSC Agents

- Resources of a particular type are managed by one OSC Agent (i.e. Shadow sets, disks)
- Resource management means
 - Monitoring the status of a resource
 - an OSC agent decides whether a resource has failed
 - Starting a resource
 - Stopping a resource
 - Cleaning up a resource
- OSC Agent consists of the OSC Agent framework and action routines that provide the resource type specific logic
- OSC Agent framework provides processing logic
 - Understand common resource attributes
 - Workflow logic
 - Communication with the OSC Service Engine

OSC Agent action routines

- Monitor
 - The monitor action routine is periodically called to determine the resource state and to verify whether the resource state has changed.
 - The online and offline monitoring interval can be configured resource specific.
 - The monitor action routine is called for all managed resources whenever the OSC agent is re-started and after every attempt to put a resource online or offline in order to verify that the operation was successful.
- Online
 - The online action routine brings a specific resource online from an offline state.

OSC Agent action routines (contd.)

- Offline
 - The offline action routine shutdown online resources
- Cleanup
 - The cleanup action routine is called (forced shutdown) for a resource after a resource has failed to come online, failed to go offline, or failed while in an online state.

The cleanup action routine has to be designed to forcibly shutdown a resource when it has failed in order to ensure that the resource does not remain in an undefined state.

The cleanup action routine will be executed only for *On-Off* resources, since these resources are typically not cluster aware. *On-Off* resources have to be offline before they can be brought online on another OSC cluster member.

OSC Agent action routines (contd.)

- Actions routines can be implemented either using DCL scripts or as C functions
- OSC Agent action routines can be defined resource specific
 - Thus, an OSC Agent may call different action routines for resources of the same type
- Due to this design it is easy to develop new OSC Agents

OSC Service Engine

- Active on all OSC cluster members
- It monitors and controls the OSC agents on a node:
 - Starts all the required OSC Agents on a node whenever the OSC environment is started on a particular node.
 - Stops all required OSC Agent processes when the OSC environment is shutdown on a node.
 - Guarantees that all pending service group, service and resource transactions complete before the shutdown request is executed.
 - Monitors the status of the OSC Agents running on the node. The OSC Service Engine periodically checks the receipt of heartbeat signals from the OSC Agents. If this check fails (it has received no heartbeat message from an agent within a predefined time interval) for an OSC Agent, the OSC Service Engine automatically restarts the appropriate OSC Agent if it is allowed to. The agent fault processing behavior by the OSC Service Engine can be defined agent specific.

OSC Service Engine (contd.)

- Maintains/updates the status of services and service groups locally configured according to the status information received from the OSC Agents.
- Forwards the resource, service and service group status information to the OSC Master Control Process.
- Guarantees that all resource, service and service group administrative commands received from the OSC Master Control Process are executed according to the configured dependencies.
 - Eg. if the OSC Service Engine receives the online command for a service group from the OSC Master Control Process, the OSC Service Engine ensures that all services of the service group and all resources defined within each of these services are brought online bottom-up according to the configured dependencies.

OSC Master Control Engine

- Started on all OSC cluster members
- Active only on one OSC cluster member
- All standby OSC Master Control Engine instances check the health of the active OSC Master Control Engine
- Knows the status of all service groups on all OSC cluster members. Thus, the active OSC Master Control Engine is the one that decides whether to put a service group online, offline or to failover the service group .
- The OSC Master Control Engine checks the health of the OSC Service Engines running on the OSC cluster members
 - Checks the heartbeat signals sent by the OSC Service Engines.
 - If the OSC Master Control Process does not receive a heartbeat within a predefined time period from a particular OSC Service Engine it automatically tries to restart that OSC Service Engine according to the OSC Service Engine control parameters

OSC Master Control Engine

- The active OSC Master Control process provides the console interface for interactive OSC management.
 - Up to 64 console links are supported
- SCS layer utilized for reliable communication between the OSC Service Engines

OSC OpenVMS Processes

dite@mhs4									
OpenVMS V8.4 on node MHS3 24-SEP-2015 14:57:08.55 Uptime 50 21:06:46									
Pid	Process Name	State	Pri	I/O	CPU	Page	flts	Pages	
20F264BA	OscAgtDECnet	LEF	9	859247	0 00:00:32.07		458	514	
20F264BC	OscAgtDSK	LEF	9	429929	0 00:00:33.31		462	518	
20F264BE	OscAgtFailIP	LEF	10	1431663	0 00:00:57.81		458	514	
20F264C0	OscAgtMYSQL	LEF	9	732030	0 00:00:20.53		460	516	
20F264C2	OscAgtPERF	LEF	9	859176	0 00:00:33.33		458	514	
20F264C4	OscAgtPRC	LEF	9	12323240	0 00:06:47.93		468	524	
20F264C6	OscAgtSHD	LEF	10	713296	0 00:00:53.61		472	530	
20F952B3	OSC\$CTRL	LEF	12	836	0 00:00:03.43		1005	651	
20F952B4	OSC\$SRV	LEF	9	3684461	0 00:00:07.81		913	557	
OpenVMS V8.4 on node MHS4 24-SEP-2015 14:57:08.55 Uptime 50 21:33:34									
Pid	Process Name	State	Pri	I/O	CPU	Page	flts	Pages	
20BF31B4	OSC\$CTRL	LEF	13	3163	0 00:17:04.69		1302	1034	
20BF31B5	OSC\$SRV	LEF	11	3684433	0 00:00:13.72		853	561	
20B6AE9B	OscAgtDSK	LEF	9	429971	0 00:00:10.92		468	524	
20B6AEA5	OscAgtFailIP	LEF	9	1025958	0 00:00:49.56		464	520	
20B52EA8	OscAgtMYSQL	LEF	10	434826	0 00:00:10.40		466	522	
20B522AA	OscAgtPERF	LEF	9	1025865	0 00:00:50.82		464	520	
20B6AEAC	OscAgtPRC	LEF	9	17064104	0 00:10:32.89		467	523	
20B6AEAE	OscAgtSHD	LEF	9	713343	0 00:00:55.65		479	537	
20B6A2B0	OscAgtDECnet	LEF	9	1025912	0 00:00:51.11		464	520	
MHS4 john									

OSC Installation

- VMSINSTAL
 - @SYS\$UPDATE:VMSINSTAL OSC034 disk:
[kit-directory]
 - Common Cluster Disk
 - Otherwise the CFG Database has to be manually distributed.
 - a license valid for a 32 node OpenVMS cluster is automatically applied.

•

OSC Directories

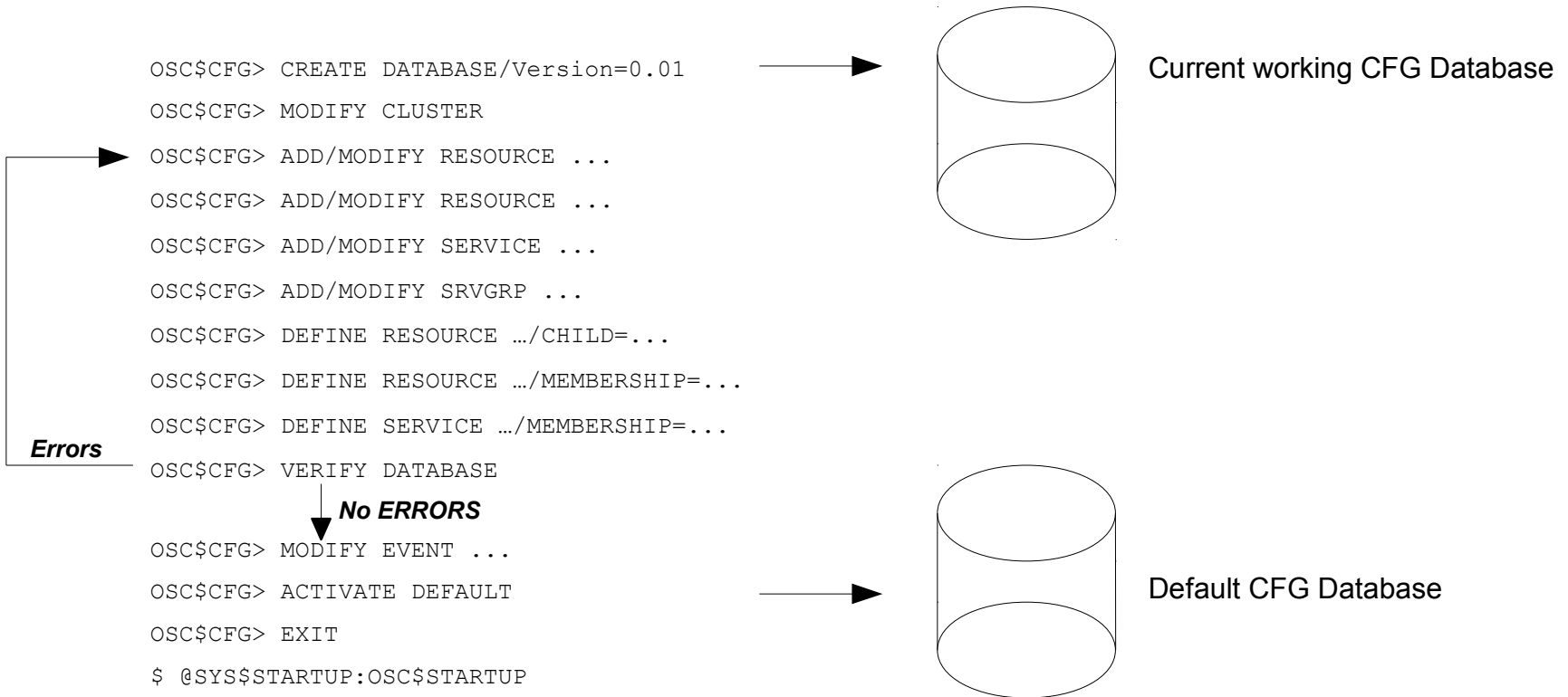
- OSC\$COMMON:[000000]
 - OSC\$COMMON:[BIN]
 - EXEs for IA64 and AXP
 - Startup Scripts
 - OSC\$COMMON:[CFG]
 - CFG Databases
 - OSC\$TEMPLATES.CFG
 - Template Agent Monitor, Offline, Online scripts
 - This is where I put my scripts
 - OSC\$COMMON:[EXAMPLES]
 - OSC\$COMMON:[HELP]
 - OSC\$COMMON:[INCLUDE]
 - .H and OLB library files
 - OSC\$COMMON:[LOG]
 - OSC\$CTRL_<node>.LOG
 - OSC\$SRV_<node>.LOG
 - OSC\$EVENT.LOG_<YYYY-MM-DD>
 - OSCAGT<agent>_<node>.LOG
 - OSC\$COMMON:[STARTUP]
 - Copies of what is in SYS\$STARTUP

OSC Configuration Utility

- `$ MC OSC$BIN:OSC$CFG.EXE`
- Common OSC Configuration Utility to
 - Manage OSC configuration projects (databases)
 - Configure within an OSC configuration project
 - OSC cluster
 - OSC Master Engine control parameters
 - OSC Service Engine control parameters
 - OSC agent definition and control parameters
 - Resources and resource dependencies
 - Services and service dependencies
 - Service groups
 - OSC events and notification method

OSC Databases and Configuration

- Assuming that no Default CFG database exists and OSC has not yet been started



- Only one CFG Database can be used by OSC at anyone time, this is called the “*Default CFG DB*”.
- The “*Default CFG DB*” cannot be modified. Only “*working CFG Databases*” can be modified.
- There can be many “*working CFG Databases*”, differentiated by version numbers.
- The working database that has been opened is called the “*current working CFG DB*”.

OSC\$CFG Database Commands

- **CREATE**
 - OSC\$CFG> CREATE DATABASE/VERSION=V8.3
- **CLOSE**
 - OSC\$CFG> CLOSE DATABASE
- **COPY**
 - OSC\$CFG> COPY DATABASE OSC\$COMMON:[CFG]OSC\$CONFIG_190.DAT;1 –
_OSC\$CFG> /VERSION=V10.0
- **SHOW**
 - OSC\$CFG> SHOW DATABASE
- **OPEN**
 - OSC\$CFG> OPEN DATABASE/VERSION=V10.0
- **VERIFY**
 - OSC\$CFG> VERIFY DATABASE
- **ACTIVATE**
 - OSC\$CFG> ACTIVATE DEFAULT
- **EXPORT (into a text file)**
 - OSC\$CFG> EXPORT SYS\$LOGIN:OSC_V10-0.CFG
- **LOAD (from a text file)**
 - OSC\$CFG> LOAD SYS\$LOGIN:OSC_V10-0.CFG

OSC\$CFG Configuration Commands

RESOURCE (RES) / SERVICE (SER) / SERVICE GROUPS (SRV)

- ADD (calls the appropriate wizard)
 - OSC\$CFG> ADD RESOURCE PRC::WASD
- AUTOCONFIGURE (only for Shadow Set Resources)
 - OSC\$CFG> AUTOCONFIG SHD/EXCLUDE=(DSA10, DSA20)
- COPY
 - OSC\$CFG> COPY RESOURCE PRC::WASD PRC::WASD-NEW
- MODIFY (calls the appropriate wizard)
 - OSC\$CFG> MODIFY CLUSTER ! Starts it off !
- SHOW
 - OSC\$CFG> SHOW RESOURCE /BRIEF
- RENAME
 - OSC\$CFG> RENAME RESOURCE PRC::WASD PRC::WASD-NEW

OSC\$CFG>MODIFY CLUSTER

```

dite@mhs3
OSC$CFG>
OSC$CFG> modify cluster

Welcome to the OSC cluster configuration wizard
-----

Use quotation marks for case sensitive string input.
Otherwise string inputs will converted to upper case.

Dscr: OscCtrl OSC cluster name
Attr: {OscCtrlClusterName} [TEST-OSC]:
Dscr: OscCtrl node list
Attr: {OscCtrlNode} [MHS3,MHS4]:
Dscr: OscCtrl SrvGrp failover policy (Static | Load-Balancing)
Attr: {OscCtrlFailoverPolicy} [Static]:
Dscr: OscCtrl process priority
Attr: {OscCtrlProcPriority} [10]:
Dscr: OscCtrl reconnect interval
Attr: {OscCtrlReconnInterval} [30 sec]:
Dscr: OscCtrl time to wait for primary
Attr: {OscCtrlStartupWait} [60 sec]:
Dscr: OscCtrl expected votes
Attr: {OscCtrlExpVotes} [1]:
Dscr: OscCtrl auto-adjust quorum when a node is removed from OSC
Attr: {OscCtrlAutoAjustQuorum} [Yes]:
Dscr: OscCtrl Simulation Mode
Attr: {OscCtrlSimulate} [No]:
OSC$CFG-I-MODIFY, OSC cluster definitions have been updated in the current working CFG Database
OSC$CFG>

```

OSC\$CFG> SHOW SRVGRP

```

dite@mhs3
OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG> show srvgrp */brief

      SRVGROUP
      -----

      DXD$DSA
      HP - PERFDAT - SRVGRP
      MANTISBT - SRVGRP
      MTA - SRVGRP
      PMDF - SRVGRP
      SAMBA$SRVGRP
      WASD - SRVGRP

OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG>
OSC$CFG>

```

OSC\$CFG> SHOW SRVGRP /LAYOUT

```

dite@mhs3
OSC$CFG> sho srvgrp WASD-SRVGRP/layout
24-SEP-2015 11:09:18: OSC-I-LICCHECK, OSC is licensed to run on 32 nodes, termination date: 1-JAN-2100
24-SEP-2015 11:09:18: OSC-W-CFG, child resource SHD::DSA155 of resource PRC::MTA$MTA-PRC is unknown on node MH
S3
24-SEP-2015 11:09:18: OSC-W-CFG, child resource SHD::DSA155 of resource PRC::PMDF is unknown on node MHS3
24-SEP-2015 11:09:18: OSC-W-CFG, 2 minor configuration issues were found.
24-SEP-2015 11:09:18: OSC-W-CFG, child resource SHD::DSA154 of resource PRC::MTA$MTA-PRC is unknown on node MH
S4
24-SEP-2015 11:09:18: OSC-W-CFG, child resource SHD::DSA154 of resource PRC::PMDF is unknown on node MHS4
24-SEP-2015 11:09:18: OSC-W-CFG, 2 minor configuration issues were found.

Current working CFG database SRVGRP layout:
-----

WASD-SRVGRP                                     OK
| -MHS3                                         OK
|   | -[Ser] WASD-SRV                         OK
|   |   | -[Res] PRC::WASD                   OK
|   |   |   | -[Res] SHD::DSA420             OK
| -MHS4                                         OK
|   | -[Ser] WASD-SRV                         OK
|   |   | -[Res] PRC::WASD                   OK
|   |   |   | -[Res] SHD::DSA420             OK
-----

OSC$CFG>

```

OSC\$CFG> SHOW RES SHD::DSA420

```

dite@mhs3
RESOURCE:  SHD::DSA420                Managed by: OscAgtSHD

Attributes [Size]          Values
-----
ResourceDescription [64]:  SHADOWSET FOR SAMBA CONFIGURATION
ResourceCategory [16]:    ON-ONLY
ServiceMember [1024]:     SAMBAS$SRV,HP-PERFDAT-SRV,WASD-SRV
ResourceDependency [1024]:
Critical [4]:              TRUE
Enabled [4]:               TRUE
ClusterLocked [4]:        FALSE
CluLckResDisAllow [1024]:
OnlineMonitorInterval [4]: 30
OfflineMonitorInterval [4]: 30
ToleranceLimit [4]:       2
FaultOnMonitorTmo [4]:    TRUE
FaultOnMonitorTmoLimit [4]: 4
DisableMangeFault [4]:    FALSE
OnlineRetryLimit [4]:      0
OnlineWaitLimit [4]:       2
OnlineTmoWaitLimit [4]:   2
OfflineWaitLimit [4]:     2
OfflineTmoWaitLimit [4]:  2
RestartLimit [4]:         0
CleanRetryLimit [4]:      5
TimeoutRetryLimit [4]:    5
Conflimit [4]:            600
MonitorScript [256]:
MonitorTmo [4]:           20
OnlineScript [256]:
OnlineTmo [4]:             300
OfflineScript [256]:
OfflineTmo [4]:            300
CleanScript [256]:
CleanTmo [4]:              60
OpenScript [256]:
OpenTmo [4]:               60
ArgList [256]:             ShadName, ShadMembers, VolumeLabel, FullMbrOnMount, FullMbrOnMonitor
PassFuncCode [4]:          FALSE
ScriptExecUser [32]:
ShadName [32]:              DSA420
ShadMembers [256]:          $!$DGA10420:,$!$DGA20420:
VolumeLabel [32]:          WEBDEV
FullMbrOnMount [4]:        TRUE
FullMbrOnMonitor [4]:      FALSE

Press return to continue >

```

OSC\$CFG>SHOW RES PRC::WASD

```

dite@mhs3
OSC$CFG> sho res prc::wasd/advance

RESOURCE:   PRC::WASD                      Managed by: OscAgtPRC

Attributes [Size]      Values
-----
ResourceDescription [64]:  PROCESS RESOURCE FOR WASD WEB SERVER
ResourceCategory [16]:    ON-OFF
ServiceMember [1024]:     WASD-SRV
ResourceDependency [1024]: SHD::DSA420
Critical [4]:             TRUE
Enabled [4]:              TRUE
ClusterLocked [4]:       FALSE
CluLckResDisAllow [1024]:
OnlineMonitorInterval [4]: 30
OfflineMonitorInterval [4]: 30
ToleranceLimit [4]:       2
FaultOnMonitorTmo [4]:    TRUE
FaultOnMonitorTmoLimit [4]: 4
DisableMangeFault [4]:    FALSE
OnlineRetryLimit [4]:      0
OnlineWaitLimit [4]:       2
OnlineTmoWaitLimit [4]:    2
OfflineWaitLimit [4]:      2
OfflineTmoWaitLimit [4]:   2
RestartLimit [4]:         3
CleanRetryLimit [4]:      5
TimeOutRetryLimit [4]:    5
ConFLimit [4]:           600
MonitorScript [256]:      OSC$COMMON:[CFG.WASD]WASD$PRC_MONITOR.COM
MonitorTmo [4]:           25
OnlineScript [256]:       OSC$COMMON:[CFG.WASD]WASD$PRC_ONLINE.COM
OnlineTmo [4]:            300
OfflineScript [256]:      OSC$COMMON:[CFG.WASD]WASD$PRC_OFFLINE.COM
OfflineTmo [4]:           300
CleanScript [256]:
CleanTmo [4]:             60
OpenScript [256]:
OpenTmo [4]:              60
ArgList [256]:            ProcessList, ProcessCount
PassFuncCode [4]:         FALSE
ScriptExecUser [32]:
ProcessList [256]:        WASD:80
ProcessCount [4]:         1

Press return to continue >

```

OSC\$CFG – Monitor Script

```

dite@mhs3
$ set noon
$!
$ OSC$ ONLINE = 1
$ OSC$ OFFLINE = 9
$ OSC$ FAULTED = 19
$ OSC$ ERROR = 12
$ OSC$ RETURN = 5
$ OSC$ NOPROC = 2280
$!
$! P1 = Resourcename
$! P2 = Processname
$! P3 =
$! P4 =
$! P5 =
$!
$!=====
$!
$!
$ success_status=251756553
$!
$! Check if the WASD Process is there
$!
$ gosub CHECK_PRC_WASD
$
$ if ($STATUS .eq. OSC$ OFFLINE) then exit (OSC$ OFFLINE)
$!
$! Check if WASD is responding
$!
$! Curl has to be defined (sylogin.com is not used)
$ CURL == "$DSA110:[IA64.OPENVMS.FREWARE.CURL]curl.exe_openssl"
$ node=F$GETSYI("NODENAME")
$ curl "-lsS" -o nl: http://'node
$ status=f$integer($status)
$ if status .eq. success_status then exit (OSC$ ONLINE)
$ exit (OSC$ OFFLINE)
$!
$! -----
$!
$!
$ CHECK_PRC_WASD:
$!
$!
$ context = ""
$ CHECK_START:
$ pid = F$PID(context)
$ if (pid .EQS. "") then return (OSC$ OFFLINE)
$ if (F$EXTRACT (0,f$length(P2), F$GETJPI (pid, "PRCNAM")) .EQS. "'P2'") then return (OSC$ ONLINE)
$ goto CHECK_START
$!
MHS3_john typ/pa OSC$COMMON:[CFG.WASD]WASD$PRC_MONITOR.COM

```

OSC\$CFG – Online Script

```

dite@mhs3
$ set noon
$!
$ OSC$_ONLINE = 1
$ OSC$_OFFLINE = 9
$ OSC$_FAULTED = 19
$ OSC$_ERROR = 12
$ OSC$_RETURN = 5
$ OSC$_NOPROC = 2280
$
$ OSC$_MONITOR_DELAY_DEFAULT = 5
$!
$! P1 = Virtual Resourcenename
$! P2 = Processname
$! P3 = Prccount
$! P4 =
$! P5 =
$!
$!=====
$!
$!
$! Check existence of startupscript SYS$STARTUP:WASD$COMMON_STARTUP.COM
$!
$ if f$search ("sys$startup:wasd$common_startup.com") .nes. ""
$ then
$   @sys$startup:wasd$common_startup.com
$   exit (OSC$_RETURN)
$ else
$   exit (OSC$_ERROR)
$ endif
MHS3_john

```

OSC\$CFG – Offline Script

```

dite@mhs3
$ set noon
$!
$ OSC$_ONLINE = 1
$ OSC$_OFFLINE = 9
$ OSC$_FAULTED = 19
$ OSC$_ERROR = 12
$ OSC$_RETURN = 5
$ OSC$_NOPROC = 2280
$
$ OSC$_MONITOR_DELAY_DEFAULT = 5
$!
$! P1 = Resourcenname
$! P2 = Processname
$! P3 = Prccount
$! P4 =
$! P5 =
$!
$!=====
$!
$!
$! Define WASD HTTPD Command
$!
$ httpd := "$DSA420:[WASD_ROOT.IA64]HTTPD_SSL.EXE;"
$!
$! Shutdown immediately
$!
$ httpd/D0=exit=now
$ exit (OSC$_RETURN)
MHS3 john

```

OSC\$CFG – Defining Dependencies

```

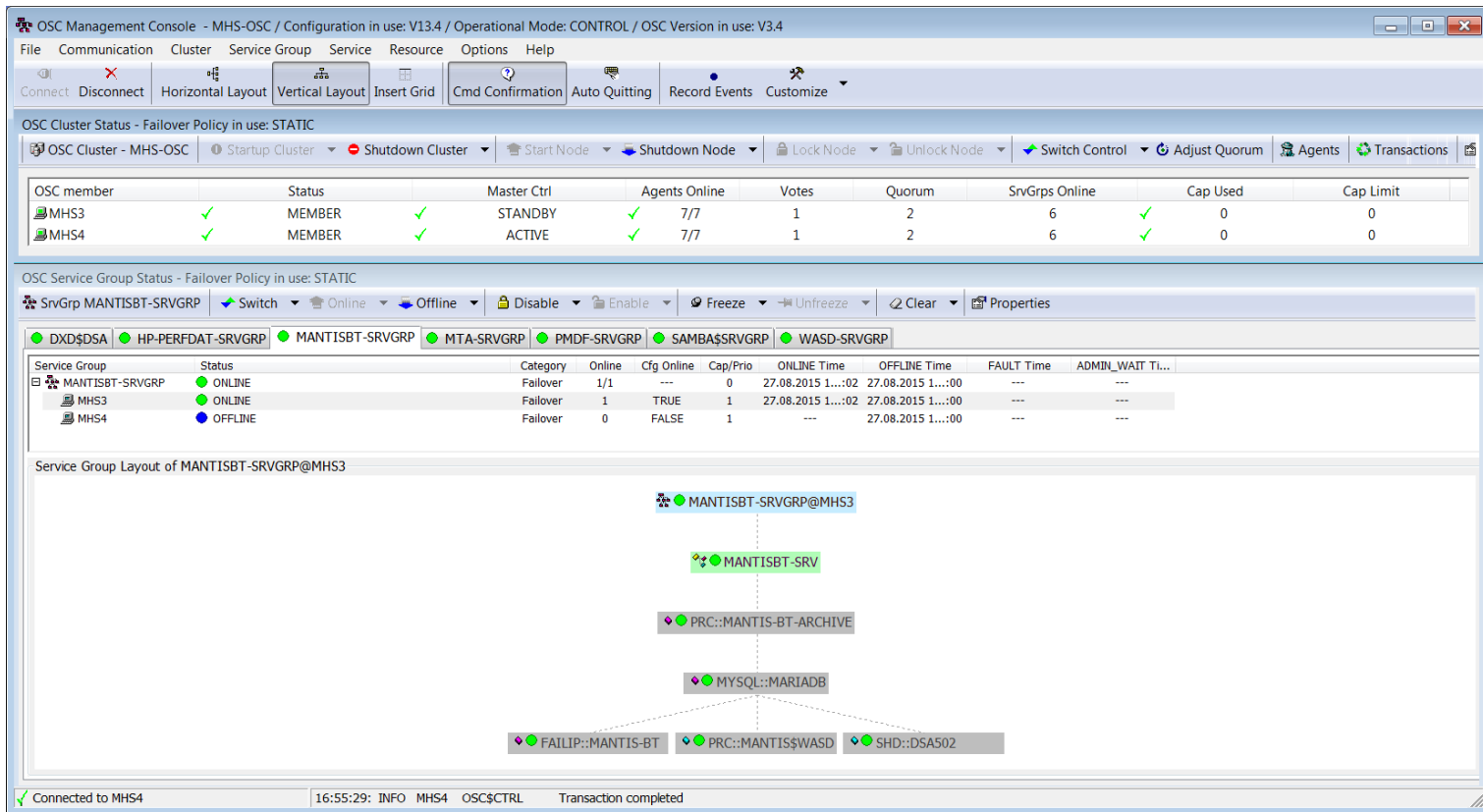
WASD-SRVGRP                                OK
|-MHS3                                      OK
|  |-[Ser] WASD-SRV                         OK
|  |  |-[Res] PRC::WASD                     OK
|  |  |  |-[Res] SHD::DSA420                OK
|-MHS4                                      OK
|  |-[Ser] WASD-SRV                         OK
|  |  |-[Res] PRC::WASD                     OK
|  |  |  |-[Res] SHD::DSA420                OK

```

- Defining Resource Dependency
 - OSC\$CFG> DEFINE RES PRC::WASD/CHILD=SHD::DSA420
- Defining Service (Membership) Dependency
 - OSC\$CFG> DEFINE RES PRC::WASD/MEMBERSHIP=WASD-SRV
- Defining Service Group (Membership) Dependency
 - OSC\$CFG> DEFINE SER WASD-SRV/MEMBERSHIP=WASD-SRVGRP
- Defining Service Group Interdependencies
 - OSC\$CFG> DEFINE SRVGRP <...> /DISALLOW=<srvgrpX,srvgrpY,...>

OSC Management

- Command Line OSC\$MGR>
- GUI – (only Windows based)



OSC Management Console - MHS-OSC / Configuration in use: V13.4 / Operational Mode: CONTROL / OSC Version in use: V3.4

File Communication Cluster Service Group Service Resource Options Help

Connect Disconnect Horizontal Layout Vertical Layout Insert Grid Cmd Confirmation Auto Quitting Record Events Customize

OSC Cluster Status - Failover Policy in use: STATIC

OSC Cluster - MHS-OSC Startup Cluster Shutdown Cluster Start Node Shutdown Node Lock Node Unlock Node Switch Control Adjust Quorum Agents Transactions

OSC member	Status	Master Ctrl	Agents Online	Votes	Quorum	SrvGrps Online	Cap Used	Cap Limit
MHS3	✓ MEMBER	✓ STANDBY	✓ 7/7	1	2	6 ✓	0	0
MHS4	✓ MEMBER	ACTIVE	✓ 7/7	1	2	6 ✓	0	0

OSC Service Group Status - Failover Policy in use: STATIC

SrvGrp MANTISBT-SRVGRP Switch Online Offline Disable Enable Freeze Unfreeze Clear Properties

Service Group	Status	Category	Online	Cfg Online	Cap/Prio	ONLINE Time	OFFLINE Time	FAULT Time	ADMIN_WAIT TI...
MANTISBT-SRVGRP	ONLINE	Failover	1/1	---	0	27.08.2015 1...:02	27.08.2015 1...:00	---	---
MHS3	ONLINE	Failover	1	TRUE	1	27.08.2015 1...:02	27.08.2015 1...:00	---	---
MHS4	OFFLINE	Failover	0	FALSE	1	---	27.08.2015 1...:00	---	---

Service Group Layout of MANTISBT-SRVGRP@MHS3

```

graph TD
    A[MANTISBT-SRVGRP@MHS3] --- B[MANTISBT-SRV]
    B --- C[PRC::MANTIS-BT-ARCHIVE]
    C --- D[MYSQL::MARIADB]
    D --- E[FAILIP::MANTIS-BT]
    D --- F[PRC::MANTIS$WASD]
    D --- G[SHD::DSA502]
  
```

Connected to MHS4 16:55:29: INFO MHS4 OSC\$CTRL Transaction completed

OSC Management Utility

- `$MC OSC$BIN:OSC$MGR.EXE`
- Automatically connects to the active OSC Master Control Engine
- Management actions:
 - Status display of the OSC cluster environment
 - Status display of all service groups, services and resources
 - Management of all service groups, services and resources
 - Setting a service group online, taking it offline
 - Service group switchover
 - Freeze / disable a service group or a resource
 - Clear faults and change ADMIN_WAIT state
 - ...
 - Management of the OSC cluster environment

OSC\$MGR Command Overview

- **STARTUP**
 - OSC\$MGR> STARTUP/CLUSTER [/MODE=SIMULATION]
 - OSC\$MGR> STARTUP/NODE=MHS4
 - If previously shutdown with OSC\$MGR> SHUTDOWN/NODE=MHS4
- **SHUTDOWN**
 - OSC\$MGR> SHUTDOWN/CLUSTER
 - OSC\$MGR> SHUTDOWN/NODE=MHS4
- **LOCK / UNLOCK OSC Node**
 - OSC\$MGR> LOCK/NODE=MHS4
 - OSC\$MGR> UNLOCK/NODE=MHS4
- **Cluster Commands**
 - OSC\$MGR> ADJUST QUORUM
- **Agent Commands**
 - OSC\$MGR> RESTART AGENT <Agent> [/NODE=<node>]

OSC\$MGR Command Overview

- **Console Commands**
 - OSC\$MGR> SHOW CONSOLE
 - OSC\$MGR> DISCONNECT CONSOLE/ID=#
 - OSC\$MGR> CONNECT
- **Command Execution**
 - OSC\$MGR> DEFINE MODE [/SYNC | /ASync]
 - OSC\$MGR> FLUSH COMMAND_QUEUE
- **Logging**
 - OSC\$MGR> MONITOR EVENTS
 - OSC\$MGR> EXTRACT EVENTS [/BEFORE /SINCE /OUTPUT]
- **Fault Commands (RESOURCE | SERVICE | SRVGRP)**
 - OSC\$MGR> CLEAR RESOURCE [/ADMIN_WAIT | /FAULT] [/NODE=<node>]
- **Master Control Procs Commands**
 - OSC\$MGR> SWITCH CONTROL [/TARGET_NODE=<node>]
 - OSC\$MGR> MOVE CONTROL [/TARGET_NODE=<node>]

OSC\$MGR Command Overview

- Transaction Commands

- OSC\$MGR> SHOW TRANSACTION [/ALL|/SRVGRP|/SERVICE|/RESOURCE]
- OSC\$MGR> CANCEL TRANSACTION [/ID=#|/ALL|/NODE]

- Manual Failover Commands

- OSC\$MGR> SWITCH SRVGRP <srvgrp-name> [/TARGET_NODE/SOURCE_NODE]
- OSC\$MGR> MOVE SRVGRP <srvgrp-name> [/TARGET_NODE/SOURCE_NODE]

- Manual OFFLINE | ONLINE Commands (RESOURCE, SERVICE, SRVGRP)

- OSC\$MGR> ONLINE RESOURCE <res-name> [/NODE=<node>]
- OSC\$MGR> OFFLINE RESOURCE <res-name> [/NODE=<node>]

- Status monitoring Commands (RESOURCE | SERVICE | SRVGRP)

- OSC\$MGR> DISABLE SERVICE <serv-name> [/NODE=<node>]
- OSC\$MGR> ENABLE SERVICE <serv-name> [/NODE=<node>]

- Disabling Failover handling Commands (RESOURCE | SERVICE | SRVGRP)

- OSC\$MGR> FREEZE SRVGRP <srvgrp-name> [/NODE=<node>]
- OSC\$MGR> UNFREEZE SRVGRP <srvgrp-name> [/NODE=<node>]

OSC\$MGR Command Overview

- SHOW
 - AGENT
 - CONSOLE
 - CLUSTER
 - RESOURCE
 - SERVICE
 - SRVGRP
 - TRANSACTION

OSC\$MGR>SHOW SRVGRP [*]

```

dite@mhs3
OSC$MGR> show srvgrp

SrvGrp                Category    Summary State
-----
DXD$DSA                Failover    ONLINE
HP - PERFDAT - SRVGRP  Parallel    ONLINE
MANTISBT - SRVGRP      Failover    ONLINE
MTA - SRVGRP           Parallel    ONLINE
PMDf - SRVGRP          Parallel    ONLINE
SAMBAS$SRVGRP          Parallel    ONLINE
WASD - SRVGRP          Parallel    ONLINE

Node    SrvGrp                Cfg State    Current State
-----
MHS3    DXD$DSA                ONLINE       OFFLINE
        HP - PERFDAT - SRVGRP  ONLINE       ONLINE
        MANTISBT - SRVGRP      ONLINE       ONLINE
        MTA - SRVGRP           ONLINE       ONLINE
        PMDf - SRVGRP          ONLINE       ONLINE
        SAMBAS$SRVGRP          ONLINE       ONLINE
        WASD - SRVGRP          ONLINE       ONLINE
MHS4    DXD$DSA                OFFLINE      ONLINE
        HP - PERFDAT - SRVGRP  ONLINE       ONLINE
        MANTISBT - SRVGRP      OFFLINE      OFFLINE
        MTA - SRVGRP           ONLINE       ONLINE
        PMDf - SRVGRP          ONLINE       ONLINE
        SAMBAS$SRVGRP          ONLINE       ONLINE
        WASD - SRVGRP          ONLINE       ONLINE
  
```

Resources

www.openservicecontrol.org

- Download
 - Documentation / Presentations
 - OSC OpenVMS VMSINSTAL Kit
 - OSC Windows GUI
- Configure
- Test
- Run

Questions ?
