CA OPS/MVS System State Manager v3

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Agenda

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Introduction

Introduction

The System State Manager (SSM) facility automates and controls the management of system resources, such as started tasks, subsystems, JES initiators, and VTAM nodes. The goal of the SSM engine involves always keeping a resource in its desired state.

When the current state differs from the desired state, SSM dispatches an action to restore the resource to its proper state.

General Features	
CA Supplied Resource Policy Definitions	Keeps Current State = Desired State
Expandable to any Resource with an Up/Down, On/Off, Active/Inactive State	Prerequisite / Subrequisite Relationships
Single Location for Resource Information	Restart Resource after failure
Customer Expandable	Restart LPAR after IPL
Move Resource across LPARs within a SYSPLEX	Control Groups of Resources
ISPF, Console, or Web Control	Limits Runaway Failure Restarts

Finding the System State Manager Menu

Resource Discovery

Resource Discovery

- Quick way to start using System State Manager to monitor resources
  - Builds required infrastructure
  - Discovers resources running on LPAR
  - Identifies what the resource is and sets default values


```
SSM Resource Policy Manager ------- CA11 -- O P S V I E W ------- Subsystem OPSL
Option  ===> █

   D    Discovery     - Populate SSM policy data
   R    Resources     - Define SSM policy by resource
   UC   User Columns - Select SSM user columns to include in policy
   UT   User Types    - Define custom SSM resource types

Press END to return
```

```
CA11     ------ Resource Discovery ------ OPSL
Command ===> _____

  Add resources to the SSM Policy Manager.
  Enter a resource discovery method.

   Discovery Method:  _

   D Run resource discovery utility
   S Use existing STC and Action tables



PF3 to exit to SSM Resource List
PF12 to cancel
```

Policy Based Resource Management

Policy Based Resource Management

Overview

- Adds management facilities to standard System State Manager

- Single Location to manage resources

- CA Supplied Best Practices Resource Definitions
  - Users can create or override unique resource definitions

- Ability to Stage and Verify Changes before Product Implementation

```
SSM Resource Policy Manager ------ CA11 -- O P S V I E W ------ Subsystem OPSL
Option  ===>

    D    Discovery      - Populate SSM policy data
    R    Resources      - Define SSM policy by resource
    UC   User Columns   - Select SSM user columns to include in policy
    UT   User Types     - Define custom SSM resource types

Press END to return
```

Policy Types

Overview

- Best Practice Resource Definitions
  - Description, Start Command, Activation Complete Message, Stop Command, Inactivation Complete Message, Prerequisite Resources, IPL State, and Hook Flag

- Override CA Supplied Policies

- Create Unique Policies

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Policy Types

Managing User Policy Types

Add	Create a new User Policy Type
Browse	Display the User Policy Type definition
Copy	Copy the User Policy Type into a new definition
Delete	Remove the User Policy Type
Edit	Change the User Policy Type

Policy Types

Creating User Policy Type from an Existing Resource

```
SSM Resource List -- CA11 ----- O P S V I E W ----------------- Row 1 to 1 of 1
Command ===> _____ Scroll ===> CSR
System: *_____                                      Step Through: Y (Y/N)


Commands:  ADD LOCATE SORT    COMPARE|IMPORT|LOAD|VERIFY ALL        ?
Line       B Browse    C Copy    CP Compare    CT Create user type
Commands:  D Delete    E Edit       I Import      L Load    V Verify  ? Help

       Resource Name        Type              Table Name        Statu
Filter JES2_____         _____      _____
    CT JES2              JES2              STCTBL
******************************* Bottom of data ************************
```

Allows User Policy Types to be modeled after existing Resources

```
Add User Type      CA11 ------ O P S V I E W ----------------- Subsystem OPSL
Command ===> _____ Scroll ===> PAGE
                                                             More:     +
* Required field

* Type name: JES2_____        Description: _____  +

* Action to START the resource:
  MVSCMD("START &JOBNAME")                                           +

* Activation Completion Rule: _____ . _____
Or Activation Completion Event:
   Type Id           Text
   MSG  $HASP492      _____         +


   Prerequisite Resources: _____
   Activation IPL State: UP_____       SSMHook: N (Y/N)

* Action to STOP the resource:
  TSOCMD("OI STOPJES2")                                              +


* Inactivation Completion Rule: _____ . _____
Or Inactivation Completion Event:
   Type Id           Text
```

Custom User Columns

Managing Custom User Columns

- Allows SSM expansion to handle unique business needs while still managing through Policy Manager

- Any non-default columns added to an SSM table

```
User Column Administration CA11 -- O P S V I E W ------------ Row 1 to 5 of 5
Command ===> _____  Scroll ===> PAGE
System: *_____

Line Commands:  A Add to policy  D Delete from policy  ? Help

SEL    User Column        Table           In Policy   Message
Filter _____   _____   _____   _____
  _    OWNER              JOESTC          Y
  _    STARTTIME          JOESTC          N
  _    STATUS             JOESTC          Y
  _    BADCOL             JOECICS         Y           Table not SSM managed
  _    CICSTYPE           JOECICS         Y           Table not SSM managed
******************************** Bottom of data ********************************
```

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Resource Management

Main Panel


```
SSM Resource List -- CA11 ----- O P S V I E W -------------- Row 1 to 17 of 41
Command ===> _____  Scroll ===> CSR
System: *_____                                      Step Through: N (Y/N)


Commands:  ADD LOCATE REFRESH SORT   COMPARE|IMPORT|LOAD|VERIFY ALL  ?
Line       B Browse   C Copy    CP Compare    CT Create user type
Commands:  D Delete   E Edit    I Import      L Load    U Unload    V Verify


         Resource Name      Type            Table Name        Status
Filter   _____       _____          _____
    __   AAATEST            DATACOM-AD       STCTBL
    __   AD14MUF            DATACOM-AD       STCTBL
    __   AD14SRVR           DATACOM-SR       STCTBL
    __   ALLOCATE           ALLOCATE         STCTBL
    __   AL2QSRVR           CA7SRVR          STCTBL
    __   AL2QWEBD           CA7WEBCL         STCTBL
    __   APCDB14            DATACOM-AD       STCTBL
    __   APCMUF14           DATACOM-AD       STCTBL
    __   APPC               APPC             STCTBL
    __   JES2               JES2             STCTBL
```

Primary Line Commands

Add	Insert new Resource into Policy.
Locate	Find an existing Resource in the Policy listing
Sort	Sort Policy listing by: Name, Type, Table Name, or Status
Compare	Compare a Resources Policy and Production Entry, then display differences.
Import	Bring changes from Production back into Policy
Load	Deploy Policy changes into Production
Unload	Delete Resource from Production
Verify All	Checks required Resource data is correct

Resource Management

Line Commands

Resource Management

Editing a Resource Via Step Through

```
SSM Details --------- CA11 ----- O P S V I E W ---------------- Subsystem OPSL
Command ===> _____ Step 1 of 4
System: *


Resource Name: JES2                    Table Name: STCTBL


* Required field


* Jobname     : JES2____
  Type        : JES2_____
  SSMHook     : N (Y/N)
  Control Group : _____ +
  Description : _____ +










Enter PF6 for NextPanel
```

```
User/CA SSM Type List - CA11 -- O P S V I E W ---------- Row 1 to 14 of 260
Command ===> _____ Scroll ===> PAGE

Enter S in the SEL column to make a selection or enter the EXIT command
to return without a selection.


SEL   Name          Description                         Action
Filter             _____
 _    ABENDAID      COMPUWARE-ABEND AID                  +
 _    ACF2          CA-ACF2                              +
 _    ADABASE       SOFTWARE AG-ADABAS                   +
 _    ADMPRINT      IBM-GDDM PRINT UTILITY PGM=ADMOP     +
 _    ALLOCATE      CA-ALLOCATE                          +
 _    APPC          IBM-APPC                             +
 _    ASAP          ROCKET-ASAP                          +
 _    ASCH          IBM-APPC MVS COMMUNICATIONS SCHE     +
 _    ASM2          CA-ASM2-BACKUP-AND-RESTORE           +
 _    ASM2-IXR      CA-ASM2-BACKUP-AND-RESTORE ( INT     +
 _    ASTEX         CA-ASTEX                             +
 _    BCPII         IBM-BCPII ( BASE CONTROL PROGRAM     +
 _    BDT           IBM-BULK DATA TRANSFER               +
 _    BETA88        BETA SYSTEMS-BETA 88 DISCOVERY S     +
```

Type	Allows User to select predefined policies (CA and Customer defined) populating most required fields.
SSMHOOK	Allows for management of transient address spaces.
Control Groups	Define, or select from preexisting list, a group that can start, stop, and display together.
Description	Define the resource.

Resource Management

Editing a Resource Via Step Through


```
SSM Activation ----- CA11 ----- O P S V I E W ---------------- Subsystem OPSL
Command ===> _____    Step 2 of 4
System: *

Resource Name: JES2              Type: JES2              Jobname: JES2


* Required field

    Prerequisite Resources    : _____ +
    Activation IPL State      : UP_____
    Activation Time           : 0___
    Auto Restart              : 0_

* Action to START the resource:
    MVSCMD("START &JOBNAME")                                             +

* Activation Completion Rule: _____ . _____
Or Activation Completion Event:
    Type Id        Text
    MSG  $HASP492   _____  +


    MATCH action taken when resource is UP:
    _____  +


Enter PF6 for NextPanel or PF5 for PrevPanel
```

Prerequisite Resources	Define what resources must be UP before this resource can be started. Works in reverse order for shutting down a resource
Activation IPL State	Define if the Resource should start automatically with an IPL. • UP – Start at IPL Time • DOWN – Don't start at IPL Time • IPL – Allow resource to be started, but don't automatically issue start commands
Activation Time	Number of seconds resource is allowed to be starting before a warning message is issued.
Auto Restart	Number of times a resource will be automatically restarted before it goes UP
Start Command	Define Command required to start resource, use NULL if no command needed
Activation Completion	Define what message indicates a resource is UP • User Written Rule • Supply Message Id to have rule automatically generated
MATCH Command	Define Command required to be issued after a resource is UP

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Resource Management

Editing a Resource's Start Command

```
OPS/MVS Action Edit----------- CA11 -- O P S V I E W ---------- Sub
Option ===> 1

   Current Action Text: MVSCMD("START &JOBNAME")


 1  MVSCMD       Issue a z/OS command with no response
 2  RULE         Invoke a synchronous request rule
 3  EVRULE       Same as rule but RC>500 stops further actions
 4  REXX         Invoke an asynchronous REXX on an OSF server
 5  TSOCMD       Issue an asynchronous TSOCMD on an OSF server
 6  SETCOL       Update a column of the current resource
 7  SSMCMDS      Issue multiple z/OS commands with no response




Press END to return
```

```
MVSCMD Action Edit----------- CA11 -- O P S V I E W ---------- Subsystem OPSL
Command ===> _____

Resource Name: JES2            Type: JES2            Jobname: JES2

Current Action Text: MVSCMD("START &JOBNAME")                          +

Enter a new command or modify the existing command
   z/OS command: START JES2                                           +
```

```
SSMCMDS Action Edit----------- CA11 -- O P S V I E W ---------- Subsystem OPSL
Command ===> _____

Resource Name: JES2            Type: JES2            Jobname: JES2

Current Action Text:                                                  +

* Required field

Enter or update z/OS commands and interval values
* z/OS command 1: _____         +
* interval 1: ___
* z/OS command 2: _____         +
  interval 2: ___
  z/OS command 3: _____         +
```

Resource Management

Editing a Resource Stop Command

```
SSM Inactivation --- CA11 ---- O P S V I E W ------------------ Subsystem OPSL
Command ===> _____     Step 3 of 4
System: *

Resource Name: JES2              Type: JES2                    Jobname: JES2


  * Required field

    Inactivation Time: 0___

  * Action to STOP the resource:
    TSOCMD("OI STOPJES2")                                                   +

  * Inactivation Completion Rule: _____ . _____
Or Inactivation Completion Event:
    Type Id        Text
    EOM _____  _____           +

    MATCH action taken when resource is DOWN:
    _____        +



Enter PF6 for NextPanel or PF5 for PrevPanel
```

Inactivation Time	Number of seconds resource is allowed to be stopping before a warning message is issued.
Stop Command	Define Command required to stop resource, use NULL if no command needed
Inactivation Completion	Define what message indicates a resource is DOWN • User Written Rule • Supply Message Id to have rule automatically generated • Default entry is EOM (End of Memory)
MATCH Command	Define Command required to be issued after a resource is DOWN

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Resource Management

Editing a Resource Move Options

Move Mode	Inactive – Not a movable resource AUTO – automatically move to next available system when current system fails WTOR – Issues WTOR before moving when current system fails
Primary System	Resources home system
System List	Prioritized list of systems resource can be moved too
Move Group	Allows multiple resources to be move simultaneously
AutoHome	Indicates if the Resource should automatically return to Primary System when it becomes available

```
SSM Recovery -------- CA11 ----- O P S V I E W -----------
Command ===>
System: *

Resource Name: JES2              Type: JES2


    Move Mode     : INACTIVE
    Primary system : *,*
    System list    : _____        +
    Move group     : _____        +
    AutoHome       : N (Y/N)
```

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Resource Management

Editing Custom User Columns

```
SSM User Data ------ CA11 ----- O P S V I E W --------------- Row 1 to 2 of 2
Command ===>                                                   Step 5 of 6
System: *
Enter PF6 for NextPanel or PF5 for PrevPanel


Resource Name: JES2                     Table Name: JES2


   User Column        Typ Column Value
   -----------        --- ------------

 _ OWNER              CHR CICSGRP
 _ STATUS             CHR PHASE1
******************************** Bottom of data ********************************
```

Lists any non-default columns found in SSM Tables

Indicates type of data required

Resource Management

Editing a Resource Summary Page

```
SSM Summary/Load --- CA11 ----- O P S V I E W ------------------ Subsystem OPSL
Command ===> _____    Step 4 of 4
System: *
                                                          More:      +

Resource Name: JES2              Table Name: STCTBL

* Required field  Commands: LOAD Load resource   VERIFY Verify resource

Detail
* Jobname        : JES2_____  Type: JES2_____    SSMHook: N (Y/N)
   Control Group : _____   +
   Description   : _____   +

Activation
   Prereq          : _____   +
   IPL State       : UP_____
   Activation Time : 0___
   Auto Restarts   : 0___
* Action to START the resource:
   MVSCMD("START &JOBNAME")_____

* Activation Complete Event:
   TYPE(MSG) ID($HASP492) TEXT()

   MATCH action taken when resource is UP:
   _____
```

```
Inactivation
   Inactivation Time: 0___
* Action to STOP the resource:
   TSOCMD("OI STOPJES2")_____  +

* Inactivation Complete Event:
   TYPE(EOM) ID() TEXT()                                          +

   MATCH action taken when resource is DOWN:
   _____  +
```

In Walkthrough=Y, serves as a validation and summary screen In Walkthrough=N, editing of resource is done from this location
Hot linked back to Detail, Activation, and Inactivation panels
Save – Leaves resource in STAGING table
Load – Copies resource into Active SSM table
Verify – notifies if required information is missing or incorrect • Must have entries for Jobname, Start & Stop command • Defined Prereqs must exist • Activation and Inactivation messages must exist

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Resource Management

LOAD, UNLOAD, IMPORT, and COMPARE

COMPARE – Displays a Resources differences between the STC & ACTION Tables and the STAGING Table

STAGING Table

System State Manager Active Tables

STC Table

LOA   IMPO   UNLOAD – Removes Resource from STC and ACTION table, not touching STAGING table

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Operations

Operations

Overview

- **Ability to Start, Stop, Move Resources**

- **Multiple Options**
  - ISPF Panel
  - Console Command
  - Web Page

```
System State Manager----------- CA11 -- O P S V I E W ---------- Subsystem OPSP
Option  ===> _____
Date/Time: 2016/09/22 10:42


  1  Control          - Set/Display SSM parameters and resource tables
  2  Status           - Set/Display states of SSM controlled local resources
  3  Snapshot         - Create/Modify a local SSM started task resource table
  4  Scheduler        - Set/Display schedules for SSM controlled resources
  5  Group Manager    - Create/Manage groups of SSM resources
  A  Action Editor    - Create and maintain SSM action tables
  G  Global Status    - Set/Display states of SSM controlled global resources
  G2 SSMGAV2          - Set/Display states of SSMGAV2 moveable resources
  R  Resource Edit    - Create and maintain SSM resource tables
  W  WTOR Reply       - Respond to outstanding SSMGA WTORs
  P  Policy Manager   - SSM Resource Policy Manager


Press END to return
```

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Operations

Status Panel

```
SSM Resource Status------------ CA11 -- O P S V I E W -------- Row 1 to 17 of 76
Command ===> _____  Scroll ===> CSR
Date/Time: 2016/09/22 10:27                 Filtered: Y   View ===> ALL
System: *_____   SSM Mode: ACTIVE                       Wait ===> 30
Disp: E (B/V/E)              States        Modes
Cm Sta Resource Name    Current  Desired  Res Pre Ref Action   Message
-- ---  ------------     -------  -------  --- --- --- ------   -------
  __    APPC             UP       UP        A   A   A  ACTIVE
  __    ASCH             UP       UP        A   A   A  ACTIVE
  __    CALDAP           UP       UP        A   A   A  ACTIVE
  __    CAS9             UP       UP        A   A   A  ACTIVE
  __    CAS9DEV          UP       UP        A   A   A  ACTIVE
  __    CAS911P1         UP       UP        A   A   A  ACTIVE
  __    CAW1SNMP         UP       UP        A   A   A  ACTIVE
  __    CHORSTRT         UP       UP        A   A   A  ACTIVE
  __    CHORTSFR         UP       UP        A   A   A  ACTIVE
  __    CMGRMUF          UP       UP        A   A   A  ACTIVE
  __    CMGRSRVR         UP       UP        A   A   A  ACTIVE
  __    CSF              UP       UP        A   A   A  ACTIVE
  __    CSSMTP           UP       UP        A   A   A  ACTIVE
  __    CTS              UP       UP        A   A   A  ACTIVE
  __    DFHSM            UP       UP        A   A   A  ACTIVE
  __    DMSARH           UP       UP        A   A   A  ACTIVE
  __    DSPCMGR          UP       UP        A   A   A  ACTIVE
```

AS	Invoke the action selection simulation facility
C	Stop resource by setting desired state to CANCEL
MG	Move a Move Group of resources to an alternate system
MO	Move resource to an alternate system
OB	Invoke OPSLOG browse with jobname profile
P	Display prerequisite status
Q	Start resource and all dependent resources by setting desired states to UP
R	Start resource and all prerequisite resources by setting desired states to UP
S	Start resource by setting desired state to UP
SC	Start a Control Group of resources
U	Determine status by setting current state to UNKNOWN
W	Stop resource and all dependent resources by setting desired states to DOWN
Z	Stop resource by setting desired state to DOWN
ZC	Stop a Control Group of resources

Operations

Action Simulation Facility

Operations

Prerequisite Status


```
SSM Prereqs-------------- CA11 -- O P S V I E W ---------------- Row 1 to 2 of 2
Command ===> _____ Scroll ===> CSR
Date/Time: 2016/09/22 11:23
System: *          SSM Mode: ACTIVE                              Wait ===> 30


Prereq          States          Modes
 Name    /Current  Desired  Res Pre Ref Action  Comments and Warnings
--------/--------  --------  --- --- --- -------- -----------------------------
>       Prereqs for STCTBL.APPC
>         UP       UP        A   A   A  ACTIVE   Selected resource
STCTBL.NET
          UP       UP        A   A   A  ACTIVE
****************************** Bottom of data ********************************
```

Operations

Console Commands

- ## SSMCNTL
  - Mimics commands available in ISPF Interface

- ## SSMBEGIN
  - Allows for custom system start up options
    - Start resources based upon IPL_STATE or PREVIOUS_STATE
    - Set SSM Active, Passive, or Inactive

Operations

SSMCNTL commands

Command	Description	Command	Description
SSM CANSHUT	Cancel a system shutdown request.	SSM PREQS JOB=job	Enable prerequisite and subrequisite checking by setting job MODE=ACTIVE
SSM DISPLAY	Display all SSM entries	SSM PT TYPE=type	Set DESIRED_STATE to DOWN for specific SSM type
SSM DISPLAY EXC	Display all SSM exceptions	SSM READD ALL	Actively monitor resources by setting job MODE=ACTIVE for all resources
SSM DISPLAY GROUPS TBL=table	Display all groups for a specific table. TBL= is optional and defaults to STCTBL.	SSM READD JOB=job	Actively monitor this job by setting job MODE=ACTIVE for this job.
SSM DISPLAY GRP=group TBL=table	Display a specific group of resources for a specific table. TBL= is optional and defaults to STCTBL.	SSM REMOVE ALL	Passively monitor resources by setting MODE=PASSIVE for all resources
SSM DISPLAY JOB=job	Display a specific job	SSM REMOVE JOB=job	Passively monitor this job by setting job MODE=PASSIVE for this job.
SSM DISPLAY TYPE=type	Display specific SSM type	SSM SG GRP=group	Set DESIRED_STATE to UP for a specific group and table. TBL= is optional and defaults to STCTBL.

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Operations

SSMCNTL commands

Command	Description	Command	Description
SSM HELP	Display list of options	**SSM SHUTMAINT**	Initiate a partial system shutdown leaving resources active needed for performing maintenance.
SSM FCYCLE	Initiate a force cycle of of a job.	**SSM SHUTSYS**	Initiate complete system shutdown procedures.
SSM NOPREQS JOB=job	Disable prerequisite and subrequisite checking by setting job MODE=NOPREREQ	**SSM SHUTSSM**	Initiate shutdown of SSM managed resources only.
SSM PG GRP=group TBL=table	Set DESIRED_STATE to DOWN for a specific group and table. TBL= is optional and defaults to STCTBL.	SSM SJ JOB=job	Set DESIRED_STATE to UP for specific job
SSM PJ JOB=job	Set DESIRED_STATE to DOWN for specific job	SSM ST TYPE=type	Set DESIRED_STATE to UP for specific SSM type

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Operations

Web Interface

Operations

Web Interface

Browse States, Prerequisites and Subrequisites

Cancel Resource

Change MODE to ACTIVE, INACTIVE, NOPREREQ, PASSIVE

Start Resource and all Dependent Resources

Start Resource and All Prerequisite Resources

Start Resource

Verify Status of Resource

Stop Resource

Stop Resource and All Dependent Resources

Architecture

Architecture

Required Tables

- ## Resource table
  - Stores info about the status of each managed resource such as NAME,JOBNAME,CURRENT & DESIRED STATES, PREREQ list
- ## Action table
  - Identifies the actions that SSM is to take to get a resource to its DESIRED state and can also optionally contain user exit points to override default SSM internal logic
- ## Directory table
  - Searched by SSM to determine what Resource tables are to be managed and what associated Action tables are to be used for its resource tables

Architecture

Policy Manager Tables

- ## Policy Manager Table
  - Used to store changes before being loaded into the Resource and Action tables

- ## Type Table
  - Stores the CA Best Practice Resource Definitions. Contents in this table should not be changed

- ## User Type Table
  - Store the User Defined Resource Definitions

Architecture

Managing Tables

Manage the Resource and Action tables defined to the Directory Table

Changes Control Modes for SSM and Tables

Architecture

Control Modes

Four SSM management Modes	
ACTIVE	Performs all actions where C_S <> D_S
INACTIVE	No actions taken where C_S <> D_S
PASSIVE	No actions taken but D_S is set to C_S
NOPREREQ	Same as ACTIVE mode but no prereq checking is performed

Mode is controlled:

- Globally via the STATEMAN parameter

- At the table level via the TABLE_MODE column

- At the resource level via the MODE column

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Architecture

PREMODE and REFMODE

PREMODE - Controls whether prerequisite and subrequisite processing is performed for a resource, when DOWN to UP or UP to DOWN transitions occur.

PreMode	Description
Active	Performs both prerequisite and subrequisite processing according to the standard method that SSM uses.
Inactive	Performs neither prerequisite or subrequisite processing. *This is the same as setting MODE=NOPREREQ
PREREQ	Performs only prerequisite processing for this resource. Subrequisite processing is bypassed.
SUBREQ	Performs only subrequisite processing for this resource. Prerequisite processing is bypassed.

REFMODE - Controls whether other resources process this resource when testing their prerequisite or subrequisite references.

PreMode	Description
Active	Performs both prerequisite and subrequisite references according to the standard method that SSM uses.
Inactive	Evaluates neither prerequisite or subrequisite references to this resource.
PREREQ	Evaluates only prerequisite processing references to this resource. Subrequisite references to this resource are ignored.
SUBREQ	Evaluates only subrequisite processing references to this resource are evaluated. Prerequisite references to this resource are ignored.

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Architecture

System Start-Up Process

1. SSM engine initializes setting C_S & D_S to 'UNKNOWN' for all resource tables defined in the SSM directory table
2. SSM engine internally invokes the SSMBEGIN Request rule passing IPL, old mode, and new mode values and processes any user defined logic within SSMBEGUX that configures the D_S column, and/or produces a WTOR to force manual setting of the D_S column. This causes C_S = 'UNKNOWN' and D_S='UP/DOWN'.
3. The UNKNOWN action triggers for each resource and sets the C_S accordingly
4. PREREQ checking is performed for any C_S ='DOWN', D_S = 'UP' mismatch. User exits defined via ACTION_PROCESS=XPREREQ are triggered if they exist, otherwise default prereq checking is performed (determine if resources in PREREQ column have C_S = 'UP')
5. The UP_DOWN action (usually the START command) is performed for those resources with satisfied PREREQs
6. Enabled AOF rules trap the start-up messages produced by the SSM resources and update the C_S accordingly (STARTING,UP,ACTIVE,ONLINE...)
7. SSM sweeps the resource table until C_S=D_S

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