Server Discovery FSM

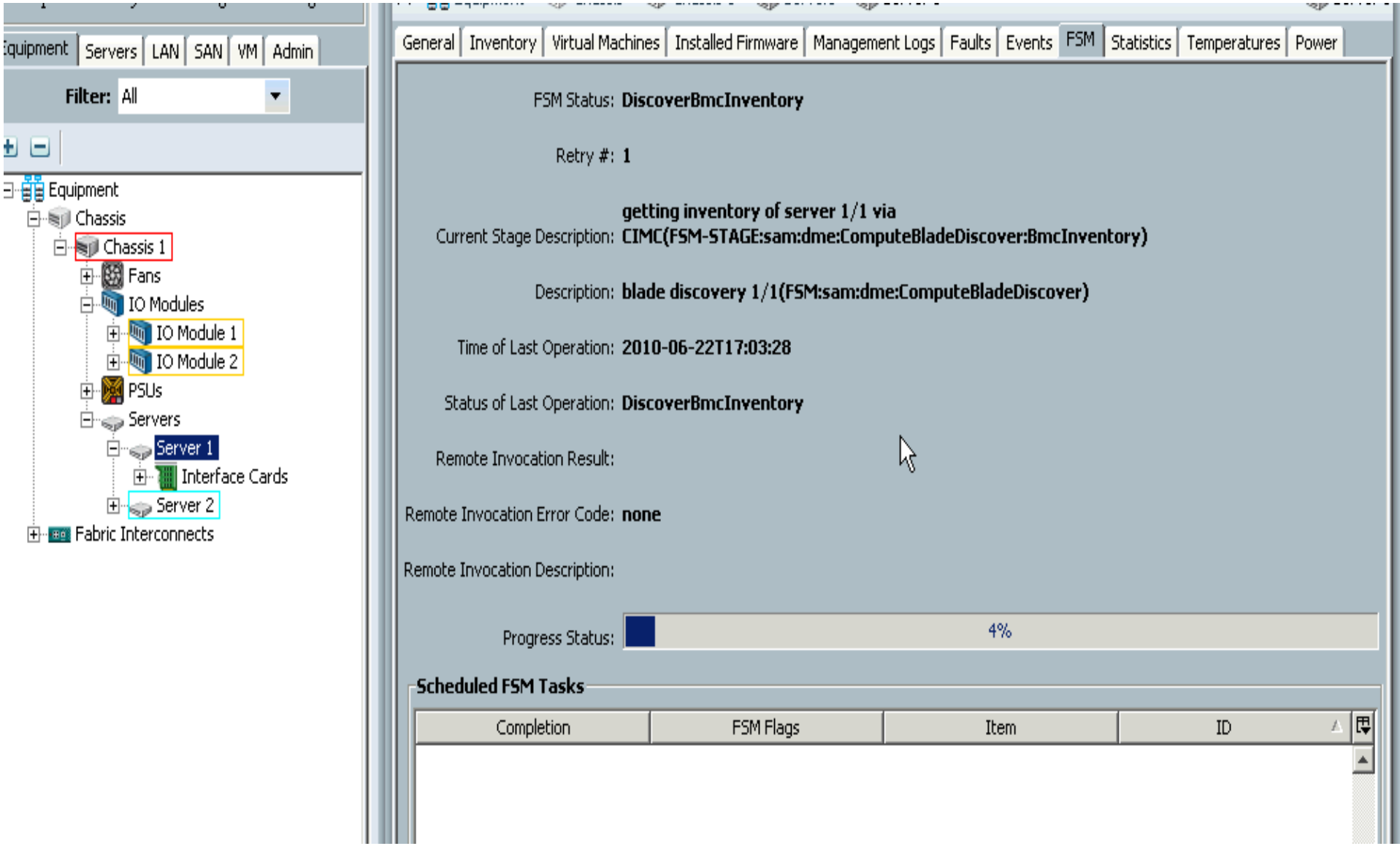
Server Discovery FSM

- FSM runs as a workflow involving many stages (FSM-Stage)
- Workflows are predefined and stages can be skipped if
  - –FSM Flags (shallow checkpoint or deep checkpoint)
- Each Stage is an interaction between DME → Application Gateway -> End Point
- DME just manages the state of the object and workflow, and then instructs the AG to perform the activity.
- AGs do the real work.
- FSM usually have the following notation
  - – FSM<Object><Workflow><Operation><Where-is-it-executed>
  - – Object “Blade/Chassis”…
  - – Workflow “Discover”/”Association”
  - – Operation “Pnuos-Config”
  - – Where is generally “”, or “A” or “B” or “Local” or “Peer”
  - – If ‘Where’ is not specified, it is executed on managingInst node

Server Discovery FSM

Stage (prefix would be) FsmComputeBladeDiscover	DME / Application Gateway	End-Point-Activity
BmcPresence	- Place Holder – Just a ping request to BladeAG	- Not touched -
BmcInventory	Blade-AG -> Retrieve FRUs, Sensors and Params(s) Params includes fw-version, POST status, Mezz Post, LED status etc.. DME -> Validates the configuration and fails if any of CPU, Memory, Adaptor is missing	BMC – Mcserver will respond to FRU, Sensors, Params call. These values are cached and BMC_MANAGER updated it once in 1 second.
Presanitize	DME – queries AG if blade can boot Blade AG – starts will_boot command	Bmc will start collecting will boot information
Sanitize	DME – queries bladeAG to check if blade can boot bladeAG – collects will_boot info from BMC	BMC will be reporting will_boot information as post

Server Discovery FSM



Server Discovery FSM

NicConfigPnuOS [nicAG	DME - has setup the PNUOS vifs and VNICs. NicAG - Gets the vnic information and deploys the vnic to Menlo/Palo using NICTOOL API. Old information is erased.	-Stores the new VNIC information in the flash. - Will be used on next startup.
SwConfigPnuOSLocal SwConfigPnuOSPeer	DME – Has setup the VIFS for the switch side of PNUOS configuration . PortAG – Will setup the VIFs and bind to the satellite port.	NXOS CLI is used to create the VETH. Utility VLAN (4047) is deployed and Old VETHs are removed.
SetupVmediaLocal SetupVmediaPeer	DME – will ask bladeAG to setup vmedia if bootorder is configured to bootfrom vmedia if utility bootorder is configured to vmedia(experimental) BladeAG – will configure bootorder to boot from vmedia	Bmc configures the bootorder for subsequent boot to vmedia.
BladeBootPnuos	DME – Sends information to boot PNUOS. BladeAG – Powers off the Blade,Sets up the Boot Order (NIC) and then Powers on the Blade.	BMC – Setup Boot-Order locally which will be used during the BIOS boot cycle.
BladeBootWait	DME – wait for 20seconds for blade to boot	
NicInventory	DME – invoke nicAG to detect adapter presence after reboot NICAG – make sure able to talk to adapter after reboot using nictool	Perform the same thing as in NicPresence state

Server Discovery FSM

Stage (prefix would be) FsmComputeBladeDiscover	DME / Application Gateway	End-Point-Activity
BiosPostCompletion	DME – invoke bladeAG to check if POST is complete bladeAG – query BMC for BIOS post completion	BMC to report if the post is complete
BladeReadSmbios	DME – Sends the FSM stage information to query SMBIOS information BladeAG – Talk to BMC to get the SMBIOS table. This indicates that BIOS post is complete. Once we get SMBIOS table, blade-ag parses it send more information on CPU, MEMORY, BIOS version.	- BIOS boots up and communicates to BMC - BMC gives the boot-order information. - BIOS after post is complete will send SMBIOS table to BMC - If No SMBIOS table, then BIOS is not booting
hagConnect [hostagentAG]	DME - sends information to host-agentAG to connect to BMC serial port. HostagentAG - Connect to BMC which acts as network<->Serial port proxy.	- BMC xinetd will spawns “x-remserial” process.
PnuOSIdent	DME – Sends information to host-agentAG to check if PNUOS has booted.. HostagentAG-> will rely this to host-agent via BMC network/serial proxy.	If the PNUOS boots and host-agent starts, the host-agent will respond to this message. This step is waiting for PNUOS boot to complete. This is the handshake protocol.

Server Discovery FSM

Stage (prefix would be) FsmComputeBladeDiscover	DME / Application Gateway	End-Point-Activity
PnuOSPolicy, PnuOSInventory	DME – Sends Message to Host-gent to send information that can retrieved via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-Agent: -Read all the inventory and send to serial ports which will get to DME - Qlogic/Emulex/Nic/LocalDisk
PnuOSScrub	DME – invokes hostagent to do scrubbing of identities HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-agent: -Scrub identities -Scrub disks
NicUnconfigPnuOS	DME – Sends information to tear down PNUOS connectivity NICAG – Removes all VNICS from the NIC	- NIC - Remove all VNIC configuration for next restart.
SwUnconfigPnuOSLocal, SwUnconfigPnuOSLocal	DME - sends information to tear down PNUOS connectivity on switch side. PortAG - Remove all the VETHs and its associated VLANs	- NXOS CLI is used to delete the VETHS.
TeardownVmediaLocal TeardownVmediaPeer	DME – invoke bladeAG to remove vmedia config.(experimental) bladeAG – removes vmedia configuration like the mapping file and vmedia user config	BMC will remove all the configured vmedia settings like the iso and user settings

Server Discovery FSM

Stage (prefix would be) FsmComputeBladeDiscover	DME / Application Gateway	End-Point-Activity
hagDisconnect	DME – Information to disconnect connectivity to remserial HostagentAG-> Disconnects the x-remserial connectivity.	Xinetd kills the x-remserial. Host-agent can nolonger talk via Serial
BmcShutdownDiscovered [bladeAG]	DME – Sends Message to shutdown the blade. Blade-AG – uses “mc_power_control” to shutdown the blade.	BMC – Will do a shutdown of the x86 side.
HandlePooling	DME – Now that discovery is complete, DME will look at the BLADE information and puts into appropriate Pool if there are pooling policy defined.	-Purely DME activity.

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
updateIBMCfw	DME – if there is a mgmt-fw-pack present, it sends message to bladeag to update bmc bladeAG – invokes bmc to start update	BMC to start update
waitForIBMCFwUpdate	DME – queries bladeAG for firmware update status Blade-AG -> queries BMC for update status	BMC – Mcserver will respond to firmware update status
activateIBMCFw	DME – send activate request to bladeAG Blade AG – sends activate request to BMC	Bmc will activate the new image
resetIBMC	DME – sends reset request to bladeAG bladeAG – sends reset request to BMC	BMC will be doing a self reboot

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
Presanitize	DME – queries AG if blade can boot Blade AG – starts will_boot command	Bmc will start collecting will boot information
Sanitize	DME – queries bladeAG to check if blade can boot bladeAG – collects will_boot info from BMC	BMC will be reporting will_boot information as post
configUserAccess	DME – Has the SP IPMI profile setup on the Blade object BladeAG – Issues the “mcclient” api to setup the IPMI information.	BMC-MCserver gets the IPMI profile (user/role) and deploys it for IPMI use case.
BladePowerOn	DME – Sends the FSM stage. This is done only for PALO/MENLO which requires power for NIC configuration. Blade-AG – Powers on the blade via “mc_power” API	BMC – Will power-on the x86 host side. If the blade is already powered on, it is a NO-OP

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
SwConfigPnuOSLocal SwConfigPnuOSPeer	DME – Has setup the VIFS for the switch side of PNUOS configuration . PortAG – Will setup the VIFs and bind to the satellite port.	NXOS CLI is used to create the VETH. Utility VLAN (4047) is deployed and Old VETHs are removed.
updateAdaptorNwFw	DME – sends updates request to bladeAG to update adaptors from network (only on host-pack) nicAG – sends update request to adaptor using nictool	Adaptor will start update
waitForAdaptorNwFwUpdate	DME – query nicAG about update status of adaptor nicAG– queries adaptor about update status using nictool	Adaptor responds if the update is done
activateAdaptorNwFw	DME – sends activate request to nicAG nic-AG – sends activate request to adaptor	Adaptor does activate of the image

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
NicConfigPnuOS [nicAG	DME - has setup the PNUOS vifs and VNICs. NicAG - Gets the vnic information and deploys the vnic to Menlo/Palo using NICTOOL API. Old information is erased.	-Stores the new VNIC information in the flash. - Will be used on next startup.
BladeBootPnuos	DME – Sends information to boot PNUOS. BladeAG – Powers off the Blade,Sets up the Boot Order (NIC) and then Powers on the Blade.	BMC – Setup Boot-Order locally which will be used during the BIOS boot cycle.
BladeBootWait	DME – wait for 20seconds for blade to boot	
BiosPostCompletion	DME – invoke bladeAG to check if POST is complete bladeAG – query BMC for BIOS post completion	BMC to report if the post is complete

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
hagConnect [hostagentAG]	DME - sends information to host-agentAG to connect to BMC serial port. HostagentAG - Connect to BMC which acts as network<->Serial port proxy.	- BMC xinetd will spawns “x-remserial” process.
PnuOSIdent	DME – Sends information to host-agentAG to check if PNUOS has booted.. HostagentAG-> will rely this to host-agent via BMC network/serial proxy.	If the PNUOS boots and host-agent starts, the host-agent will respond to this message. This step is waiting for PNUOS boot to complete. This is the handshake protocol.
PnuOSPolicy, PnuOSValidate PnuOSSelfTest BiosImgUpdate	DME – Sends Message to Host-gent to update BIOS via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-Agent: -Starts updating bios using iflash32
StorageCtrlImgUpdate	DME – Sends Message to Host-gent to update LSI via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-agent: - Starts updating lsi controller based on host-fw-pack

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
HbaImgUpdate	DME – Sends Message to Host-gent to update HBA via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	-Host-agent: -Updates HBA optionrom, firmware,etc
NicImgUpdate	DME – Sends information to host-agentAG to check if PNUOS has booted.. HostagentAG-> will rely this to host-agent via BMC network/serial proxy.	Host-agent: For now nothing
PnuOSInventory	DME – Sends Message to Host-gent to send information that can retrieved via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-Agent: -Read all the inventory and send to serial ports which will get to DME - Qlogic/Emulex/Nic/LocalDisk new versions
PnuOSConfig	DME – Sends Message to Host-gent to burn new identity via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-agent: - Burn the NIC and HBA identities

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
PnuOSLocalDiskConfig	DME – Sends Message to Host-gent to do LSI config via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-agent: -does the raid configuration
NicUnconfigPnuOS	DME – Sends information to tear down PNUOS connectivity NICAG – Removes all VNICS from the NIC	- NIC - Remove all VNIC configuration for next restart.
SwUnconfigPnuOSLocal, SwUnconfigPnuOSLocal	DME - sends information to tear down PNUOS connectivity on switch side. PortAG - Remove all the VETHs and its associated VLANs	- NXOS CLI is used to delete the VETHS.
SwConfigHostOSLocal SwConfigHostOSPeer	DME – Has setup the VIFS for the switch side of Hostos configuration . PortAG – Will setup the VIFs and bind to the satellite port.	NXOS CLI is used to create the VETH for host os

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
NicConfigHostOS [nicAG	DME - has setup the HostOS vifs and VNICs. NicAG - Gets the vnic information and deploys the vnic to Menlo/Palo using NICTOOL API. Old information is erased.	-Stores the new VNIC information in the flash. - Will be used on next startup.
hagDisconnect	DME – Information to disconnect connectivity to remserial HostagentAG-> Disconnects the x-remserial connectivity.	Xinetd kills the x-remserial. Host-agent can nolonger talk via Serial
configSol	DME - sends information to setup SOL to bladeAG bladeAG - talks to bmc using mctools and setup SOL	- BMC will setup the sol params.
prepareForBoot	DME – sends host bootorder to bladeAG. bladeAG – Will setup the host bootorder using mctools.	BMC will setup the next bootorder for the plate

Server association FSM

Stage (prefix would be) FsmComputeBladeAssociate	DME / Application Gateway	End-Point-Activity
configUUid	DME - sends host uuid to bladeAG bladeAG - sets the host uuid to be used to BMC using mctools	-BMC will setup the host uuid
bladeBootHost	DME –sends host powercycle request to bladeAG bladeAG – will issue host powercycle request to BMC	BMC will power cycle the x86.

Server disassociation FSM

Stage (prefix would be) FsmComputeBladeDisassociate	DME / Application Gateway	End-Point-Activity
configUserAccess	DME – Has the default IPMI profile setup on the Blade object BladeAG – Issues the “mcclient” api to setup the IPMI information.	BMC-MCserver gets the IPMI profile (user/role) and deploys it for IPMI use case.
BladePowerOn	DME – Sends the FSM stage. This is done only for PALO/MENLO which requires power for NIC configuration. Blade-AG – Powers on the blade via “mc_power” API	BMC – Will power-on the x86 host side. If the blade is already powered on, it is a NO-OP
Presanitize (NO-OP in aptos release)	DME – queries AG if blade can boot Blade AG – starts will_boot command	Bmc will start collecting will boot information
Sanitize (NO-OP in aptos release)	DME – queries bladeAG to check if blade can boot bladeAG – collects will_boot info from BMC	BMC will be reporting will_boot information as post

Server disassociation FSM

Stage (prefix would be) FsmComputeBladeDisassociate	DME / Application Gateway	End-Point-Activity
NicUnconfigHostOS [nicAG	DME - has removed the HostOS vifs and VNICs. NicAG - Gets the vnic information and deploys the vnic to Menlo/Palo using NICTOOL API. Old information is erased.	-Adaptor removes the host vnic configuration
SwUnconfigHostOSLocal, SwUnconfigHostOSPeer	DME - sends information to tear down HOSTOS connectivity on switch side. PortAG - Remove all the VETHs and its associated VLANs	- NXOS CLI is used to delete the VETHS.
SwConfigPnuOSLocal SwConfigPnuOSPeer	DME – Has setup the VIFS for the switch side of PNUOS configuration . PortAG – Will setup the VIFs and bind to the satellite port.	NXOS CLI is used to create the VETH. Utility VLAN (4047) is deployed and Old VETHs are removed.
NicConfigPnuOS [nicAG	DME - has setup the PNUOS vifs and VNICs. NicAG - Gets the vnic information and deploys the vnic to Menlo/Palo using NICTOOL API. Old information is erased.	-Stores the new VNIC information in the flash. - Will be used on next startup.

Server disassociation FSM

Stage (prefix would be) FsmComputeBladeDisassociate	DME / Application Gateway	End-Point-Activity
BladeBootPnuos	DME – Sends information to boot PNUOS. BladeAG – Powers off the Blade,Sets up the Boot Order (NIC) and then Powers on the Blade.	BMC – Setup Boot-Order locally which will be used during the BIOS boot cycle.
BladeBootWait	DME – wait for 20seconds for blade to boot	
BiosPostCompletion	DME – invoke bladeAG to check if POST is complete bladeAG – query BMC for BIOS post completion	BMC to report if the post is complete
hagConnect [hostagentAG]	DME - sends information to host-agentAG to connect to BMC serial port. HostagentAG - Connect to BMC which acts as network<->Serial port proxy.	- BMC xinetd will spawns “x-remserial” process.

Server disassociation FSM

Stage (prefix would be) FsmComputeBladeDisassociate	DME / Application Gateway	End-Point-Activity
PnuOSIdent	DME – Sends information to host-agentAG to check if PNUOS has booted.. HostagentAG-> will rely this to host-agent via BMC network/serial proxy.	If the PNUOS boots and host-agent starts, the host-agent will respond to this message. This step is waiting for PNUOS boot to complete. This is the handshake protocol.
PnuOSPolicy, PnuOSValidate PnuOSUnconfig	DME – Sends Message to Host-gent to remove identity info via PNUOS HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-Agent: -Removes all the NIC/HBA identities
PnuOSScrub	DME – invokes hostagent to do scrubbing of identities HostAgentAG – forwards it to BMC which will send to host-agent in PNUOS	Host-agent: -Scrub disks
NicUnconfigPnuOS	DME – Sends information to tear down PNUOS connectivity NICAG – Removes all VNICS from the NIC	- NIC - Remove all VNIC configuration for next restart.

Server disassociation FSM

Stage (prefix would be) FsmComputeBladeDisassociate	DME / Application Gateway	End-Point-Activity
SwUnconfigPnuOSLocal, SwUnconfigPnuOSLocal	DME - sends information to tear down PNUOS connectivity on switch side. PortAG - Remove all the VETHs and its associated VLANs	- NXOS CLI is used to delete the VETHS.
hagDisconnect	DME – Information to disconnect connectivity to remserial HostagentAG-> Disconnects the x-remserial connectivity.	Xinetd kills the x-remserial. Host-agent can nolonger talk via Serial
UnconfigUUId	DME – invokes bladeAG to do scrubbing of uuid bladeAG – invokes bmc to restore uuid to the physical burnt in one	BMC sets the original uuid back
Shutdown	DME – invokes bladeAG to power of x86 bladeAG – invokes BMC to power off x86	-BMC shutsdown x86
Unconfigsol	DME – invokes bladeAG to remove sl config bladeAG – invokes bmc to remove sol config	-BMC removes the SOL setup