## Pre-Checks and Preparations in GMP

* GMP checks the necessary prerequisites, e.g. free IP addresses in the relevant access and storage networks
* IP addresses and hostnames are being reserved by GMP
* New ldap user install\_\_rest\_\_\*\*\*\* would be created in ldapmaster-dev, with UUID as the password.
* If IP not in correct network, will be deleted new one will be create.
* Generate $MAC.cfg, needed by the installer
* Download and parse current dhcpd config from install server
* Retrieve BladeServer network configuration/parameters
* Adapt, write and upload new dhcpd config
* Backup old dhcpd config and syntax check new config and restart dhcpd
* Build and upload individual BladeServer config to install server
* Generate pxe config under /tftpboot/pxelinux.cfg for sles12 by *[-f /opt/imal/bin/tftp-config.sh ] && /opt/imal/bin/tftp-config.sh $cmd\_params $used\_mac || echo 'tftp install script not found.'*
* Set BladeServer bootoption to PXE, based on server type to reboot and set boot option.
* Restart BladeServer
* Watch and log the Installation process
* (The actual installation is done by the Blade-Installer)

## DHCP and PXE Boot

* The machine boots up and tries to boot via PXE
  + Get an IP address via DHCP
  + Load the kernel from the next-server, given by the DHCP server
  + Load the initrd from the next-server, given by the DHCP server
* Mostly sles11 only support legacy BIOS boot. But for UCSC-C460-M4 boot option should be EFI. Sles12 support both legacy BIOS boot and EFI.

## Initrd(Blade installer):

* Run read\_ini.sh
* DHCP: use sysconfig/network files generated by installer and do a simple ifup
* Get install server from DHCP lease
* Start ssh
* Load the modules: ipmi\_si, ipmi\_devintf and then get MAC
* According to the MAC, use SCP to download $file.cfg from install server
* Download image
* Clean up and create LVM volume groups
* Check which image format is used and proceed accordingly
* Prepare chroot
* Generate fstab
* Generate initrd: if image format is dmp.gz, generate /etc/sysconfig/kernel
* Install grub: config /etc/default/grub
* Config bond configuration and try to start bond.
* Config /etc/sysconfig/network/routes and /etc/resolv.conf.
* Ensure correct NIC name: cp -p /etc/udev/rules.d/70-persistent-net.rules /mnt/etc/udev/rules.d/70-persistent-net.rules
* Create /etc/hostname and /etc/HOSTNAME
* Create /opt/imal/... directories:
  + mkdir -p /mnt/opt/imal/etc/
  + mkdir -p /mnt/opt/imal/log/
  + mkdir -p /mnt/opt/imal/log/simple-bladeinstaller
* Store the cfg file that GMP generated to /opt/imal/etc/bladeinstaller\_install.ini
* Copy the log file into /opt/imal/log/simple-bladeinstaller/
* Put repo and proxy addresses in /etc/hosts – HEC
* Write firstboot and lastboot
* Reboot

## Kiwi-firstboot systemd service

* The system starts the kiwi-firstboot systemd service, which in turn runs all scripts located in /kiwi-deploy/firstboot.d/ in numerical order
* 00-correct-repos.sh: sed -i 's#repo.wdf.sap.corp#repo#g' /etc/zypp/repos.d/\*
* 01-opt-imal-etc-release.sh: generate /opt/imal/etc/release
* 01-rpms-before-firstboot.sh: rpm -qa --queryformat "%{NAME} %{VERSION} %{RELEASE}\n" | sort -n >>/opt/imal/etc/rpms\_before\_firstboot
* 02-import-zypper-keys.sh: add https proxy and repo refresh
* 03-fix\_clearlogs\_file\_permissions.sh: chmod for /root/.ssh/ and /root/.ssh/clearlogs\_id\_dsa
* 50-make-grub2-great-again.sh: config /etc/default/grub
* 69-ntp.sh: setup ntp server
* 70-HV-chef.sh:
  + connects to the GMP-API and fetches the chef configuration (/etc/chef/client.rb)
  + runs the chef-client (three times, as this mitigated strange errors in the past)
  + sends the chef logs to GMP
  + enables the kiwi-lastboot service and reboots the system after 5 minutes

## Chef

**Chef server and chef environment: /etc/chef/client.rb**

**Chef base role and chef runlist: /etc/chef/firstboot.json**

* Chef provides the system with a baseline configuration profile
  + complete the network setup, e.g. populate /etc/resolv.conf with needed entries
  + setup basic services like sshd, LDAP, ntp, mail, etc.
  + install packages and start services for SAP/SaaS related services like joschyd
* Chef does not enforce correct configuration during the machines whole lifetime, as it is only run during installation
* Chef does only configure those files, services or packages that it has been told to configure

**Link:**

**Base role**

<https://github.wdf.sap.corp/CloudChef/chef/blob/master/roles/auto-generated/hwp_saas_prod-dxb1-sapcp-sandbox-a-asf-xenhv-sles12sp2.json>

**Environment**

<https://github.wdf.sap.corp/CloudChef/chef/blob/master/environments/_saas-hv-prod.json>

**Run list**

<https://github.wdf.sap.corp/CloudChef/chef/blob/master/roles/_saas-hv-init-prod.json>

recipe[hv::packages\_ptf],recipe[sec\_groups]

## Kiwi-lastboot systemd service

* Unset proxy: unset http\_proxy and https\_proxy
* Set status to “System available in pool”
* Disable kiwi-lastboot
* Reset the boot\_option to HDD
* Remove logger user install\_\_rest\_\_\*\*\*\* from ldap.
* GMP cleans up trace/cfg/pid file and removes the installation files (PXE-boot configuration, $MAC.cfg, $MAC...) from the install server.

## install server: /home/dump/cfg/5c:b9:01:ce:ae:30.cfg

*[Basics]*

*controllernumber = 1*

*mirror = NO*

*installdisk = 1*

*mirrordisk =*

*hostname = bsa7489*

*defaultgateway = 10.118.150.1*

*autoreboot = YES*

*usevlan = 1*

*[Location]*

*hwpool = PROD-ROT-DC12-HANA-DB02-2-SP3*

*landscape = ProdRot6*

*[Filesystems]*

*root = 10*

*var = 2*

*tmp = 2*

*[Image]*

*imageserver = 172.19.69.21*

*imageuser = dump*

*dumpfile = sles11\_sp3\_x86\_64\_prod\_rot6\_hana\_snop\_db\_2.dmp.gz*

*[FilerInterface]*

*ip =*

*[NICs]*

*eth0 = 5C:B9:01:CE:AE:30*

*eth1 = 5C:B9:01:CE:AE:38*

*eth2 = 5C:B9:01:CE:AE:31*

*eth3 = 5C:B9:01:CE:AE:39*

*[Interfaces]*

*bond0.150 = 10.118.150.121/23 access*

*bond0.160 = 10.118.165.73/21 storage*

*[Logging]*

*user = install\_\_rest\_\_bsa7489*

*uuid = 068DAC080EE311E7B7A89FD57F11723C*

## install server: /tftpboot/pxelinux.cfg/01-5c-b9-01-9a-cc-4c

*### config for rsa0740*

*default sles12*

*label sles12*

*kernel linux-inst.12*

*append initrd=initrd-inst.12 vga=0 instserver= brokenmodules=e1000,tg3,usb-storage nomodeset net.ifnames=0 biosdevname=0*

*implicit 0*

*display message-inst.12*

*prompt 1*

*timeout 30*

## install server: /tftpboot/pxelinux.cfg/default

*default manual*

*### append "ip=<bootip>:<serverip>:<gw>:<netmask> BOOTIF=01-<mac-address>" for debugging purposes*

*ipappend 3*

*# manual*

*#label manual*

*# kernel linux-inst.11*

*# append initrd=initrd-inst.11 vga=0 brokenmodules=e1000,tg3,usb-storage*

*# changed to sp4 based sap-bladeinstaller-efi*

*label manual*

*kernel linux-inst.11sp4*

*append initrd=initrd-inst.11sp4 vga=0 nomodeset brokenmodules=e1000,tg3,usb-storage*

*implicit 0*

*display message-inst.11*

*prompt 1*

*timeout 30*

## install server: /etc/dhcpd.conf

*subnet 172.19.13.128 netmask 255.255.255.192 { {*

*allow bootp;*

*allow booting;*

*default-lease-time 28000;*

*max-lease-time 56000;*

*ignore unknown-clients;*

*not authoritative;*

*log-facility local6;*

*next-server 172.19.76.48;*

*option routers 172.19.13.129;*

*option subnet-mask 255.255.255.192;*

*option broadcast-address 172.19.13.191;*

*option domain-name "wdf.sap.corp";*

*option domain-name-servers 172.19.8.160, 172.19.8.161;*

*host bsa1686 {*

*filename "pxelinux.0";*

*fixed-address 172.19.13.135;*

*hardware ethernet d8:d3:85:b1:7e:48;*

*}*

*}*