

PXE Client: Monitor Node

Step	Component	Configuration Requirement
SYSTEM BOOT FROM 50G NIC	BIOS	Boot first from 50G NIC at pciaddr=17:00:0 (N.B. HEX 17 = DEC 1*16+7 = 23; hence: enp23s0) HOW? DEL on startup to enter BIOS configuration utility
	50G NIC	PXE Boot enabled, VLAN=2 HOW? configurable from BIOS utility (ctrl-B on startup) or OS (Linux) with mstconfig wrapper: use osn_mlx_config.sh in RPM "osn-support" to toggle NIC settings (enable/disable PXE)
CLIENT OS IMAGE LOAD	50G NIC	
CLIENT OS INSTALLATION	anaconda (Red Hat installer)	1. Retrieve ks.cfg from https://kickstart1/rhel/ks/7.6/osnproto2.el7
		2. Run %pre script. Ours has 4 tasks: a) fetch SSL ca-cert from https://kickstart1/osn-ca-chain.cert.pem for SSL certificate validation during installation b) fetch the pod configuration file, e.g. https://kickstart1.hsi.osn/rhel/ks/podcfg/pod_config.nwu01 c) generate a password %include file (/tmp/ks.secrets) for ks.cfg (passwords are from pod_config) d) detect local SSDs and generate the local storage configuration %include file, /tmp/disk.allocation
		3. Re-parse ks.cfg with %includes Identify installation repositories, including custom repo. url --url=https://kickstart1.hsi.osn/rhel/7.6/server/x86_64/os repo --name=OSN --baseurl=https://kickstart1.hsi.osn/rhel/custom/7/x86_64
		4. Install packages
		5. Run %post install script provided by osn-support RPM: /var/lib/ks/scripts/ks_post.sh configures static networking, enables ansible access

PXE Services (Pod, Command Center)

Step	Service@Location	Requirement
CLIENT BOOT FROM 50G NIC	DNS@nwu-mon1 (pod local)	Map PXE Client Hostname to IP address. e.g., nwu-mon3 <=> 172.16.2.13
	DHCP@nwu-mon1 (pod local)	1. Map PXE-enabled NIC's MAC address to hostname. host nwu-mon3 { hardware ethernet ec:0d:9a:ab:27:22; fixed-address nwu-mon3; } 2. Specify tftp server IP and file to download for boot. next-server 172.16.2.7; filename "pxelinux.0";
	TFTP@nwu-mon1 (pod local)	1. tftp must be enabled, started, and allow traffic from the client IP. Note that /etc/sysconfig/iptables-config must have IPTABLES_MODULES="nf_conntrack_tftp" if the firewall is running. 2. pxelinux.0 (provided by the syslinux RPM) is present at the tftp server's root directory. (/var/lib/tftpboot/pxelinux.0) 3. pxelinux.0 uses the NIC's MAC address to locate its configuration file: /var/lib/tftpboot/pxelinux.cfg/01-ec-0d-9a-ab-27-22 4. pxelinux.0 configuration tells pxelinux.0 where to obtain a working kernel and OS image, relative to the root directory of the tftp server. The configuration file can have multiple stanzas corresponding to different runtime environments (e.g. rescue mode, kickstart, boot local), with one default. Example: default ks label ks kernel rhel/7.6/server-x86_64/vmlinuz append initrd=rhel/7.6/server-x86_64/initrd.img ip=enp23s0.2:dhcp vlan=enp23s0.2:enp23s0 console=tty1 console=ttyS1,115200n8 inst.lang=en_US inst.keymap=us inst.sshd rd.noverifyssl inst.ks=https://kickstart1/rhel/ks/7.6/osnproto2.el7 osn_site=nwu osn.podnum=01 osn.nodetype=monitor inst.loglevel=debug IPAPPEND 2 5. The kernel must exist at: /var/lib/tftpboot/rhel/7.6/server-x86_64/vmlinuz (from the 'isolinux' directory on the install ISO image) "append" represents arguments passed to the kernel. "inst." arguments are for the Red Hat installer, anaconda. We can add our own here, to pass arguments to kickstart %pre and %post scripts, e.g. "osn_site=nwu" 6. "initrd=rhel/7.6/server-x86_64/initrd.img" /var/lib/tftpboot/rhel/7.6/server-x86_64/initrd.img must exist. (from the 'isolinux' directory on the install ISO image)
CLIENT OS IMAGE LOAD		
CLIENT OS INSTALLATION	httpd@jhu-mon1 (remote command center)	1. "inst.ks=https://kickstart1/rhel/ks/7.6/osnproto2.el7" The kickstart configuration file must exist at kickstart1. Note that SSL verification has been turned off so that SSL certs signed by the private OSN CA will be accepted.
	(routable over 12 via Mellanox SN2100 as layer 3 NAT gateway)	2. %pre script support files a) CA chain: https://kickstart1/osn-ca-chain.cert.pem b) Pod configuration file: https://kickstart1.hsi.osn/rhel/ks/podcfg/pod_config.nwu01 4. Package repositories must exist at: Base: https://kickstart1.hsi.osn/rhel/7.6/server/x86_64/os (copy of ISO bits) Custom: https://kickstart1.hsi.osn/rhel/custom/7/x86_64 (maintained by OSN)