Installation Instructions for Xorcom TwinStar Plus Servers

Document version: 1.0

Overview

This document describes the configuration process which must be performed at the customer site for pre-configured TwinStar Plus CTS2000/CTS3000/CXTS3000 servers. For a detailed description of how TwinStar Plus works go to:
http://www.xorcom.com/files/techdocs/pm0630-twinstar-plus-how-it-works.pdf

Server Information

	Server-A	Server-B
S/N		
Hostname	srv-a	srv-b
IP address	DHCP	DHCP

Before you power on the servers:

1. Connect the `eth1` interfaces of the servers with straight Ethernet CAT5E or CAT6 cable.
2. Connect the `eth0` interfaces of the servers to the office LAN.
3. If Astribank devices will be used in the system then connect them to both Server-A and Server-B.
   The Astribank USB socket marked as "Main" must be connected to Server-A. The Astribank USB socket marked as "Backup" must be connected to Server-B.
   Each Astribank should be connected to the same USB socket location on each server.
4. Switch on the servers.
5. If the Astribank devises are used then power them on. Make sure that all of them appear in the `lsusb` command output on Server-A. Each device must appear as `e4e4:1162`. For example:

```
# lsusb
Bus 004 Device 001: ID 0000:0000
Bus 001 Device 007: ID e4e4:1162 Xorcom Ltd. Astribank 2 series
Bus 001 Device 006: ID e4e4:1162 Xorcom Ltd. Astribank 2 series
Bus 001 Device 001: ID 0000:0000
```

The following actions must be performed for both servers:

6. Configure IP addresses, host names (optionally) and DNS on each server.
   6.1 The `eth1` interface configuration.

The eth1 interfaces on both servers are pre-configured for IP 172.16.200.1/24 and 172.16.200.2/24. You have to change the eth1 settings only if the pre-configured addresses conflict with the LAN IP configuration where the eth0 interface must be connected. In this case you have to edit the /etc/sysconfig/network-scripts/ifcfg-eth1 file. Reference the next topic for the further details.

6.2 The eth0 IP address should be defined in the /etc/sysconfig/network-scripts/ifcfg-eth0 file. For example:

```
DEVICE=eth0
BOOTPROTO=static
IPADDR=192.168.0.166
NETMASK=255.255.240.0
ONBOOT=yes
```

6.3 The hostname and the default gateway must be defined in the /etc/sysconfig/network file. For example:

```
NETWORKING=yes
HOSTNAME=srv-a
GATEWAY=192.168.0.1
```

The default gateway should be defined with the IP address suitable for the LAN where the eth0 interface is connected.

6.4 DNS server settings must be defined in the /etc/resolv.conf file. For example:

```
nameserver 8.8.8.8
```

If you don't want to configure a real DNS server then define the loop-back IP address as the DNS server:

```
nameserver 127.0.0.1
```

Important! Make sure that you do not have any non-existent name servers defined.

6.5 Define the hostnames and eth1 IP addresses in the /etc/hosts file if they have been changed. For example:

```
172.16.200.1 srv-a
172.16.200.2 srv-b
```

6.6 Apply the new IP settings.

On Server-A:

```
/etc/init.d/network restart
```

On Server-B:

```
/etc/init.d/network restart
```

If you have changed the hostname then the following command must be issued on each server:

```
hostname  new_hostname
```

Make sure that the 'uname -n' command returns the correct hostname on each server.

The following actions must be performed on Server-A only:

1. Configure the parameters in the `/usr/share/twinstar/twinstar_config.conf` file. Each parameter there is accompanied with an explanation. Usually it is necessary to define the `CLUSTER_IP` parameter that contains the IP address that will be activated on the active server only. For example:

```
CLUSTER_IP=192.168.0.253/24
```

Please note that the cluster IP address must be defined in the CIDR (Classless Inter-domain Routing) notation.

If the `eth1` IP addresses have been changed (ref. p. 6.1 "The `eth1` interface configuration.") then it is necessary to change also the following parameters:

```
SRV_A_IP=172.16.200.1
SRV_B_IP=172.16.200.2
COROSYNC_BINDNETADDR=172.16.200.0
```

Please note the `COROSYNC_BINDNETADDR` parameter network address of `eth1`.

2. Generate the public/private keys for SSH communication:

```
cd /usr/share/twinstar/
./twinstar_config keys
```

3. Configure the Servers.

If you have received the servers pre-configured for a particular set of Astribank devices then you have to configure the IP addresses only:

```
cd /usr/share/twinstar
./twinstar_config reconfigure -i
```

If the connected Astribank devices set is different then add option '-a'. The script will perform the DAHDI hardware detection and configuration, configure DRBD and cluster IP address on both servers. ***Again, you must run this script on Server-A only***.

```
cd /usr/share/twinstar
./twinstar_config reconfigure -i -a
```

4. Check the Server-A status.

4.1 Check that DRBD is working properly.

```
# cat /proc/drbd
version: 8.4.5 (api:1/proto:86-101)
GIT-hash: 1d360bde0e095d495786eaeb2a1ac76888e4db96 build by
    phil@Build64R6, 2014-10-28 10:32:53
 0: cs:Connected ro:Primary/Secondary ds:UpToDate/UpToDate A r-----
    ns:10712 nr:4796 dw:21548 dr:10541 al:17 bm:0 lo:0 pe:0 ua:0...
```

Under certain circumstances, DRBD communication between two servers can malfunction:

```
# cat /proc/drbd
```

```
version: 8.4.5 (api:1/proto:86-101)
GIT-hash: 1d360bde0e095d495786eaeb2a1ac76888e4db96 build by
    phil@Build64R6, 2014-10-28 10:32:53
 0: cs:WFConnection ro:Primary/Unknown ds:UpToDate/Inconsistent ...
    ns:117476856 nr:924 dw:21364 dr:117500022 al:29 bm:0 lo:0 ...
```

Most likely, the following command issued on srv-b will solve the problem:

```
# drbdadm connect r0
```

4.2 Check the server role.

```
# twinstar-ctl status
AstribanksCount:        0
FrozenMaster:   0
InTransition:   false
IsMaster:       true
LocalNodeId:    1
MasterNodeId:   1
NodeCount:      2
PreferredMaster:        true
Version:        1.0
```

4.3 If you have Astribank devices connected then check that the DAHDI spans are registered:

```
# dahdi_hardware -v
usb:001/002          xpp_usb+[T]  e4e4:1162 Astribank-modular FPGA-
    firmware
 MPP: TWINSTAR_PORT=0
 MPP: TWINSTAR_WATCHDOG=0
 MPP: TWINSTAR_POWER[0]=1
 MPP: TWINSTAR_POWER[1]=1
 LABEL=[usb:X1037123]       CONNECTOR=@usb-0000:00:03.3-5
        XBUS-00/XPD-00: FXS      (14)  Span 1  DAHDI-SYNC
        XBUS-00/XPD-10: FXS      (8)   Span 2
usb:001/003          xpp_usb+[T]  e4e4:1162 Astribank-modular FPGA-
    firmware
 MPP: TWINSTAR_PORT=0
 MPP: TWINSTAR_WATCHDOG=0
 MPP: TWINSTAR_POWER[0]=1
 MPP: TWINSTAR_POWER[1]=1
 LABEL=[usb:X1037124]       CONNECTOR=@usb-0000:00:03.3-6
        XBUS-01/XPD-00: E1       (31)  Span 3
        XBUS-01/XPD-10: FXS      (8)   Span 4
        XBUS-01/XPD-20: FXS      (8)   Span 5
        XBUS-01/XPD-30: FXS      (8)   Span 6
```

As you can see the DAHDI spans are registered. ("Span 1", Span 2" etc.).

The `dahdi_hardware` output provides the following useful information:

`TWINSTAR_PORT=0`	means that Astribank is working with the "Main" USB socket (0). When Astribank is connected to the Server- B (backup server) then you will see TWINSTAR_PORT=1.
`TWINSTAR_WATCHDOG=0`	means that the TwinStar watch dog is currently disabled. This is normal after twinstar_config script finish.
`TWINSTAR_POWER[0]=1`	Astribank senses voltage on USB socket 0. Therefore, Server- A is powered on.
`TWINSTAR_POWER[1]=1`	Astribank senses voltage on USB socket 1. Therefore, Server- B is powered on.
`LABEL=[usb:X1037123]`	X1037123 is the Astribank serial number
`CONNECTOR=@usb-0000:00:03.3-5`	USB connector ID where the Astribank is connected.

4.4 Check that the DAHDI channels are configured in Asterisk:

```
# lsdahdi
### Span  1: XBUS-00/XPD-00 "Xorcom XPD #00/00: FXS" (MASTER)
  1 FXS        FXOKS       (In use) (EC: OSLEC - INACTIVE)
  2 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
................................................
### Span  2: XBUS-00/XPD-10 "Xorcom XPD #00/10: FXS"
 15 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
 16 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
................................................
### Span  3: XBUS-01/XPD-00 "Xorcom XPD #01/00: E1" HDB3/CCS/CRC4 RED
 23 E1         Clear       (In use)(no pcm)(EC: OSLEC - INACTIVE)  RED
 24 E1         Clear       (In use)(no pcm)(EC: OSLEC - INACTIVE)  RED
................................................
### Span  4: XBUS-01/XPD-10 "Xorcom XPD #01/10: FXS"
 54 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
 55 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
................................................
### Span  5: XBUS-01/XPD-20 "Xorcom XPD #01/20: FXS"
 62 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
 63 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
................................................
### Span  6: XBUS-01/XPD-30 "Xorcom XPD #01/30: FXS"
 70 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
 71 FXS        FXOKS       (In use)(no pcm)(EC: OSLEC - INACTIVE)
 ................................................
```

The "`(In use)`" labels mean that Asterisk "uses" the channel.

4.5 Check that the cluster IP address is activated and the IP routing table is re-built correctly:

```
# ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
    state UP qlen 1000
    link/ether 38:60:77:9c:6c:88 brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.166/20 brd 192.168.15.255 scope global eth0
    inet 192.168.0.253/20 brd 192.168.15.255 scope global secondary eth0
    inet6 fe80::3a60:77ff:fe9c:6c88/64 scope link
       valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
    state UP qlen 1000
    link/ether 38:60:77:9c:6c:89 brd ff:ff:ff:ff:ff:ff
    inet 172.16.200.1/24 brd 172.16.200.255 scope global eth1
    inet6 fe80::3a60:77ff:fe9c:6c89/64 scope link
       valid_lft forever preferred_lft forever
```

As you can see, the cluster IP address `192.168.0.253` appears as the `secondary eth0`

```
# ip route show
172.16.200.0/24 dev eth1  proto kernel  scope link  src 172.16.200.1
192.168.0.0/20 dev eth0  scope link  src 192.168.0.253
169.254.0.0/16 dev eth0  scope link  metric 1002
169.254.0.0/16 dev eth1  scope link  metric 1003
default via 192.168.0.1 dev eth0  src 192.168.0.253
```

Note that the source address for cluster interface (`eth0` in our case) and for the default route should be equal to the cluster IP (192.168.0.253).

5. Restart the servers.

5.1 Disable the TwinStar watchdog if it is enabled for any reason. The following command will show you the current status. Alternatively you can use the `'dahdi_hardware -v'` command as described above.

```
# twinstar status
DEVICE          PORT       WATCHDOG        POWER0     POWER1
usb:001/008     0          on              yes        yes
usb:001/009     0          on              yes        yes
```

As you can see, the watchdog is enabled. Therefore, let's disable it:

```
# twinstar disable-wd
```

5.2 Reboot both Server-A and Server-B.

The watchdog has been activated;
your TwinStar Plus system is now ready for use!