



## Connecting the LAN-Cell 2 to an Existing Router

### Technote LCTN0012

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## **This TechNote applies to LAN-Cell models:**

### **LAN-Cell 2:**

LC2-411 (firmware 4.02 or later)

## **Document Revision History:**

| <b>Date</b>     | <b>Comments</b> |
|-----------------|-----------------|
| January 8, 2009 | Initial Release |

## **Introduction**

The LAN-Cell 2 can be used to provide a “secondary” Internet access pathway for an existing local area network that already has Internet connectivity via a router, firewall or other gateway. When configured as outlined in this TechNote, the LAN-Cell can provide redundant Internet connectivity to devices on the LAN via the LAN-Cell’s 3G cellular modem. In this mode, the LAN-Cell 2 functions similarly to simple cellular Ethernet modem. Typically, only minimal changes to the existing network router/firewall are required to implement the solution.

The recommended LAN-Cell 2 configuration depends on whether the primary router has one or multiple WAN interfaces. With a single WAN router, the LAN-Cell can provide an alternate in-bound connection to one or more LAN devices (see Example 1 on Page 3). This may be desirable as a backup should the primary WAN connection fail, or to force certain requests to pass through the 3G cellular WAN connection.

If the primary router has multiple WAN interfaces, the LAN-Cell 2 can be configured to serve as a full backup Internet connection for both in-bound and out-bound connections (see Example 2 on Page 6). Depending on the capabilities of the primary router, the LAN-Cell could be used for fail-over, load-balancing, or other policy-based routing scenarios.

This Technote is for illustration purposes only.

## Example 1: Single WAN Primary Router

Figure 1 shows the LAN-Cell 2 with a 3G cellular modem card installed and connected to the Internet via a cellular service provider. The LAN-Cell 2's wired Ethernet WAN port is connected to a "DMZ" port or other subnet on the primary router that is distinct (non-overlapping) from the primary LAN subnet. The primary router has only a single WAN port which is connected to the Internet.

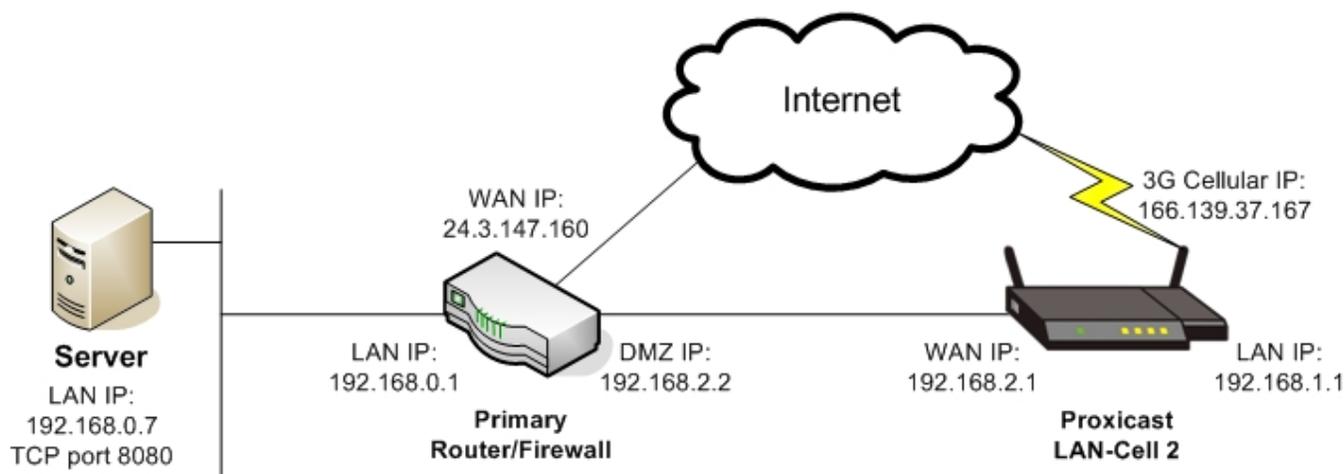


Figure 1: Single WAN Primary Router Network Topology

### Usage Notes

- In this example, the LAN-Cell's Firewall feature is **Disabled**. The primary router performs all necessary firewall functions.
- The primary router must support at least 2 distinct Ethernet subnets in addition to its WAN connection. The secondary subnet may be referred to as a demilitarized zone (DMZ), VLAN or other "protected" interface. Some low-end "SOHO-oriented" router/firewall/gateways may not support multiple subnets.
- The primary firewall must have rules defined that allow packets to flow from the "DMZ" subnet to and from the primary LAN subnet.
- The LAN-Cell 2 only handles "in-bound" traffic from the Internet to the LAN. All out-bound traffic is handled by the primary router.
- In this example, the LAN-Cell's 4 LAN ports are not used.

## LAN-Cell Configuration

1. Configure the LAN-Cell 2's 3G cellular modem for Internet access. See the *Quick Start Guide* for assistance configuring the modem for your cellular operator.
2. Disable the LAN-Cell's Firewall feature (Figure 2).

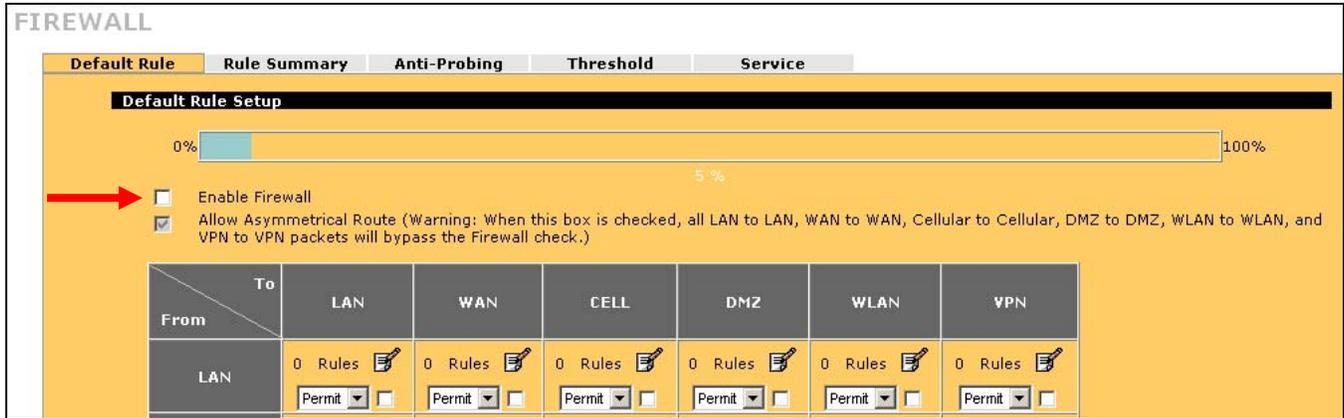


Figure 2: Disable LAN-Cell Firewall

3. Change the WAN operation mode to "Active/Active" with no Load Balancing (Figure 3).

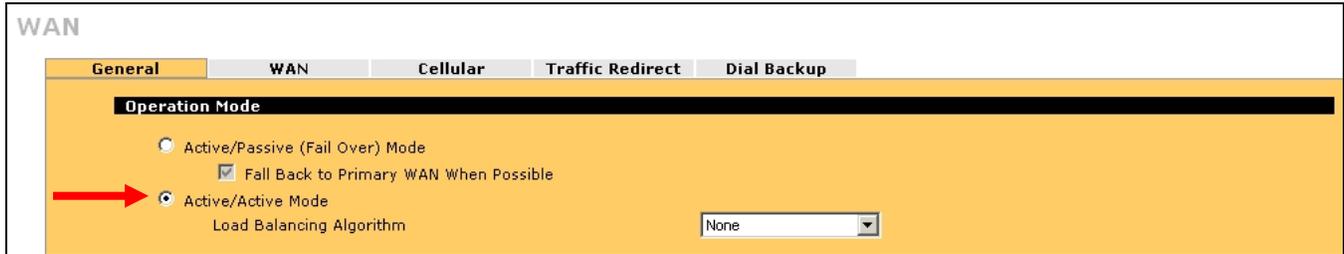


Figure 3: WAN Active/Active Mode

4. Assign the static IP address information to the LAN-Cell's wired WAN port (Figure 4). In our example, the WAN IP is 192.168.2.1 / 255.255.255.0 with a gateway address of 192.168.2.2.
5. Connect an Ethernet cable from the LAN-Cell's WAN port to the DMZ port on the primary router (Figure 1).

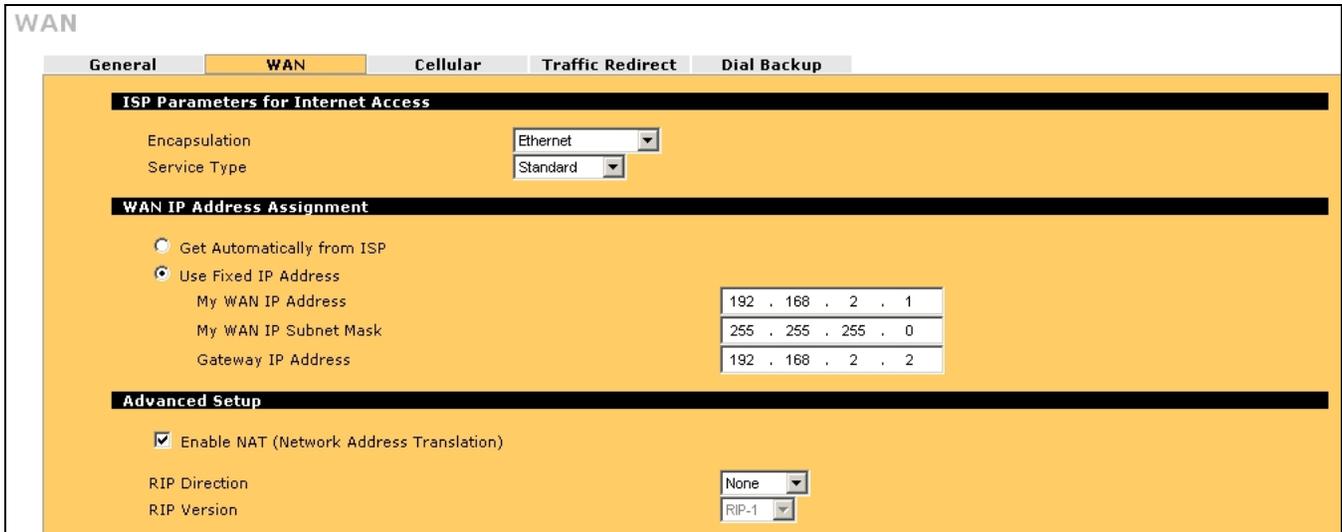


Figure 4: Static WAN IP

- Define Port Forwarding Rules for each LAN IP address and port that you need to access (Figure 5). In this example, the destination is port 8080 on the LAN IP device 192.168.0.7.

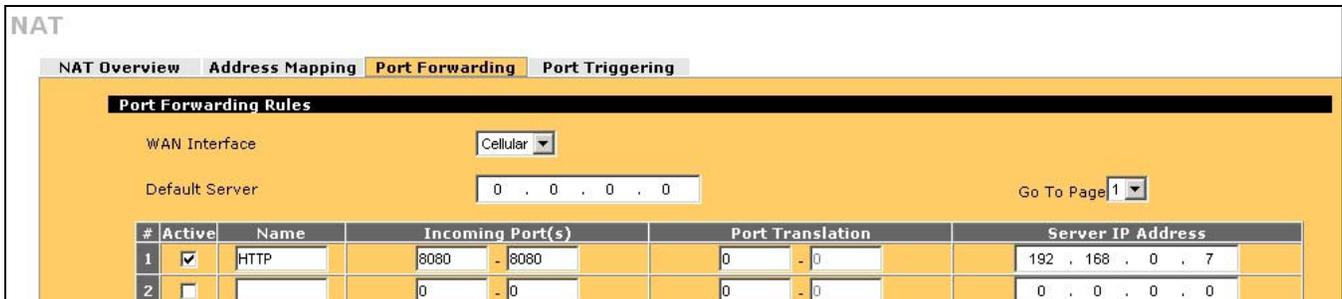


Figure 5: NAT Port Forwarding Rules

## Primary Router/Firewall Configuration

- Set the DMZ subnet address to 192.168.2.2 on the primary router.
- Ensure that firewall rules are defined to permit traffic (TCP port 8080 in this example) to flow from the DMZ subnet to the LAN and from the LAN back to the DMZ subnet.

## Testing the Configuration

To test that your configuration is correct, simply enter the 3G WAN IP of the LAN-Cell and the target port of your server (Figure 6).



Figure 6: LAN Access via 3G Cellular

## Example 2: Multi-WAN Primary Router

Figure 7 shows how to connect the LAN-Cell 2 to a primary router with two or more WAN interfaces. One of the LAN-Cell 2's wired Ethernet LAN ports is connected to a WAN port on the primary router.

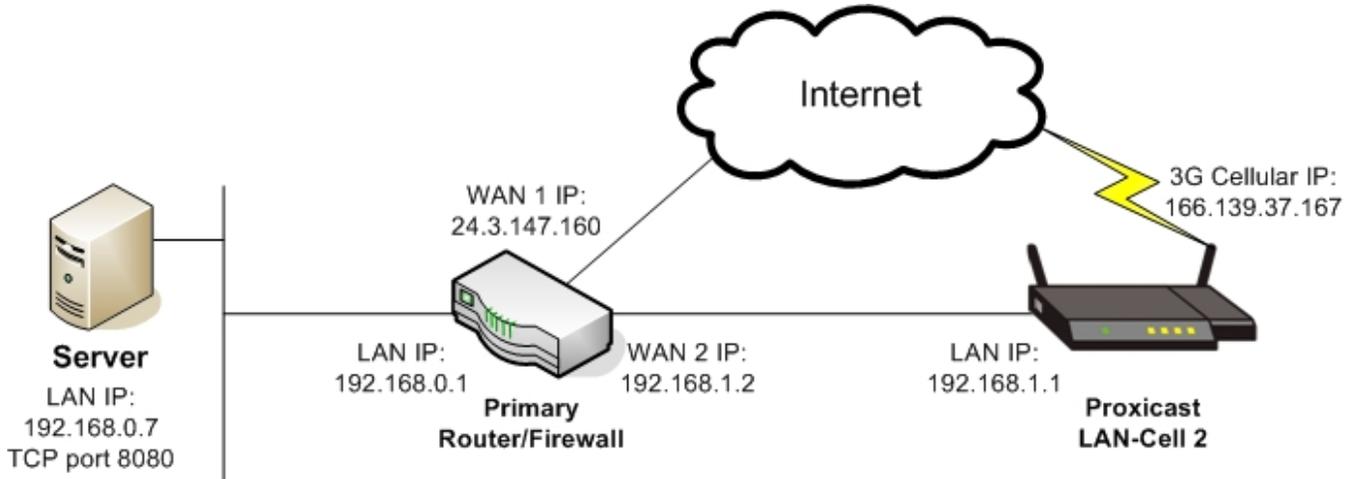


Figure 7: Multi-WAN Primary Router Network Topology

### Usage Notes

- In this example, the LAN-Cell's Firewall feature is **Disabled**. The primary router performs all necessary firewall functions.
- The primary router must support at least 2 distinct Ethernet WAN connections.
- The primary firewall must have rules defined that allow packets to flow from the WAN to and from the primary LAN subnet.
- The LAN-Cell 2 handles both "in-bound" traffic from the Internet to the LAN as well as out-bound traffic in situations where the primary WAN connection is unavailable (if configured on the primary router).
- In this example, the LAN-Cell's WAN port is not used.

## LAN-Cell Configuration

1. Configure the LAN-Cell 2's 3G cellular modem for Internet access. See the *Quick Start Guide* for assistance configuring the modem for your cellular operator.
2. Disable the LAN-Cell's Firewall feature (Figure 8).

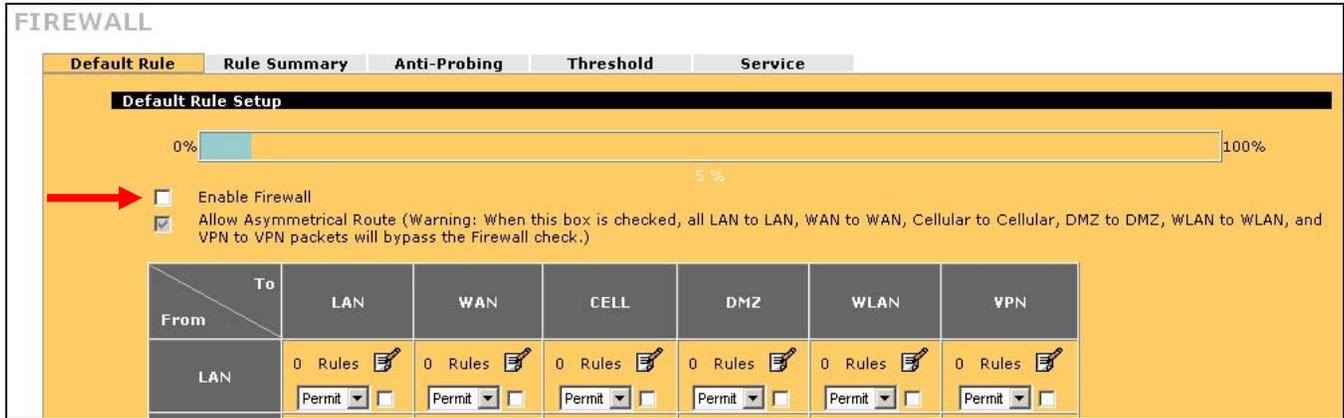


Figure 8: Disable LAN-Cell Firewall

3. Connect an Ethernet cable from one of the LAN-Cell's 4 LAN ports to one of the WAN ports on the primary router (WAN2 in Figure 7).
4. Define Port Forwarding Rules for each IP address and port that you need to access on any LAN-based devices (Figure 9). Note that for the multi-WAN case, the destination server IP is the WAN IP address of the primary router, not the final LAN IP address of the target server device.

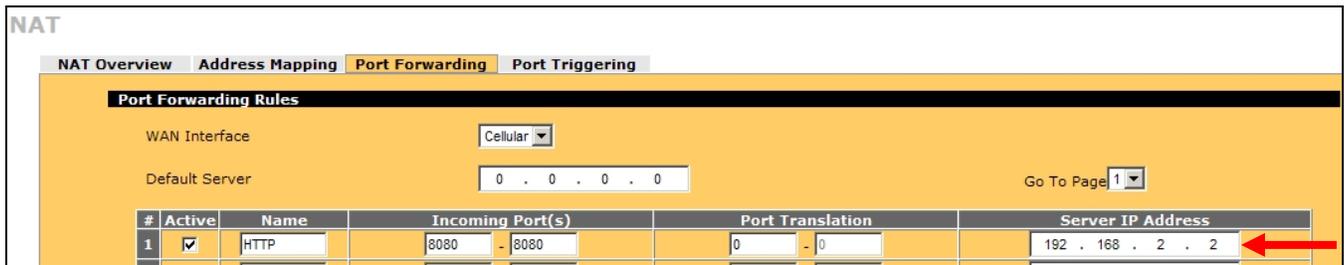


Figure 9: NAT Port Forwarding Rules

## Primary Router/Firewall Configuration

- Set the WAN2 address to 192.168.1.2 on the primary router with a remote gateway address of 192.168.1.1 (LAN-Cell's LAN IP).
- Create any necessary Port Forwarding Rules to redirect traffic from the WAN2 interface to the target LAN devices. In our example, port 8080 must be forwarded to 192.168.0.7.
- Ensure that firewall rules are defined to permit traffic (TCP port 8080 in this example) to flow from the WAN2 interface to the LAN and from the LAN back to WAN2.

## Testing the Configuration

To test that your configuration is correct, enter the 3G WAN IP of the LAN-Cell and the target port of your server (Figure 10).



**Figure 10: LAN Access via 3G Cellular**

You can also test fail-over to the LAN-Cell's 3G interface by taking down the primary WAN interface on your router (WAN1) and allowing traffic to flow through WAN2 to the LAN-Cell. The LAN-Cell should then serve as a backup gateway for all of your LAN devices.

## Frequently Asked Questions

**Q: Can I connect the LAN-Cell to the LAN segment of my primary router?**

A: No. The primary router will want to return non-local traffic through its default gateway route. If the LAN-Cell is on the LAN subnet, it cannot be the default gateway of the primary router. By placing the LAN-Cell on a DMZ or WAN interface and making it the default gateway for that subnet, the primary router will be able to correctly route packets to the LAN-Cell when appropriate and use its primary WAN interface for all other traffic.

**Q: Can I keep the LAN-Cell's Firewall enabled?**

A: Yes, but you must either create rules for each port that will be forwarding to the primary router, or change the default firewall rules to "Permit" for the affected interfaces.

**Q: Instead of creating a lot of Port Forwarding Rules, can I just use the Default Server address to forward all packets to the primary router (or server)?**

A: You can use the NAT Port Forwarding Default Server address, however you must create a set of "exception" rules for any of the LAN-Cell's Remote Management ports that you intend to use from the Cellular (or WAN) interface. These ports must be forwarded to the LAN IP address of the LAN-Cell. Otherwise, all packets will be forwarded to the Default Server and you will not be able to manage the LAN-Cell remotely (see Figure 11).

NAT

NAT Overview Address Mapping Port Forwarding Port Triggering

**Port Forwarding Rules**

WAN Interface Cellular

Default Server 192 . 168 . 2 . 2 Go To Page 1

| # | Active                              | Name   | Incoming Port(s) | Port Translation | Server IP Address |
|---|-------------------------------------|--------|------------------|------------------|-------------------|
| 1 | <input checked="" type="checkbox"/> | HTTP   | 80 - 80          | 0 - 0            | 192 . 168 . 1 . 1 |
| 2 | <input checked="" type="checkbox"/> | HTTPS  | 443 - 443        | 0 - 0            | 192 . 168 . 1 . 1 |
| 3 | <input checked="" type="checkbox"/> | SSH    | 22 - 22          | 0 - 0            | 192 . 168 . 1 . 1 |
| 4 | <input checked="" type="checkbox"/> | TELNET | 23 - 23          | 0 - 0            | 192 . 168 . 1 . 1 |
| 5 | <input checked="" type="checkbox"/> | FTP    | 20 - 21          | 0 - 0            | 192 . 168 . 1 . 1 |
| 6 | <input checked="" type="checkbox"/> | SNMP   | 161 - 161        | 0 - 0            | 192 . 168 . 1 . 1 |
| 7 | <input checked="" type="checkbox"/> | DNS    | 53 - 53          | 0 - 0            | 192 . 168 . 1 . 1 |
| 8 | <input type="checkbox"/>            |        | 0 - 0            | 0 - 0            | 0 . 0 . 0 . 0     |

Figure 11: Remote Management Port Exceptions when using Default Server

**Q: What if one of the ports I need to forward is also one of the LAN-Cell's management ports?**

A: You can change the ports that each LAN-Cell management utility uses. See **ADVANCED > REMOTE MGMT.** You must also modify the Firewall rules to permit traffic from any of the changed remote management ports from the WAN and/or CELL interface to the LAN-Cell. Change these ports and firewall rules before enabling the port forwarding rules.

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