



Configuring the Redundancy Feature in a Polycom® KIRK® Wireless Server 6000

Application Note

Introduction

The redundancy feature of the Polycom® KIRK® Wireless Server 6000 solution allows adding a backup server to the system, offering both better availability and better performance due to load balancing. By adding a backup server, the most critical failure point of the system is eliminated, allowing the system to continue running and provide service to the users, even in the event that a server fails. Any active calls or sessions handled by the failed component will however be lost.

The redundancy feature is designed to be as non-intrusive as possible. Except for a few simple redundancy options, configuration and administration of a redundant solution is not different from a single server solution. All configurations are executed on the master, and everything is presented in the same familiar menus. Configuration data and statistics are automatically propagated between all the KIRK Wireless Server 6000 entities, e.g. base stations, media resource and server.

This application note describes how to design, configure and administer a redundant KIRK Wireless Server 6000 solution including a master and a backup server.

Note: Please note that if a third party application is connected to the KIRK Wireless Server 6000, e.g. a messaging application or a nurse call application, this application must connect to the master KIRK Wireless Server 6000. In case of a failure in the master server, the application will not be able to communicate with the handsets unless the application is designed for redundancy. This is further described in the XML-RPC SDK document available upon request. Please send an email to KIRK.certified@polycom.com.

Firmware Compatibility

The KIRK Wireless Server 6000 supports the redundancy feature from firmware version PCS06A.

The communication protocol between the KIRK Wireless Server 6000, the KIRK Media Resources and the KIRK IP Base Stations is not backward compatible starting with PCS06A of the KIRK Wireless Server 6000 and PCS06A of the KIRK IP Base Station. This means that KIRK IP Base Stations or KIRK Media Resources with a firmware version older than PCS06A will not be able to connect to a KIRK Wireless Server running firmware PCS06A or newer. To minimize downtime, update KIRK IP Base Stations, KIRK Media Resources and KIRK Wireless Server 6000 to firmware PCS06A before rebooting any of these. This will ensure that no firmware older than PCS06A will try to connect to a PCS06A or newer firmware.

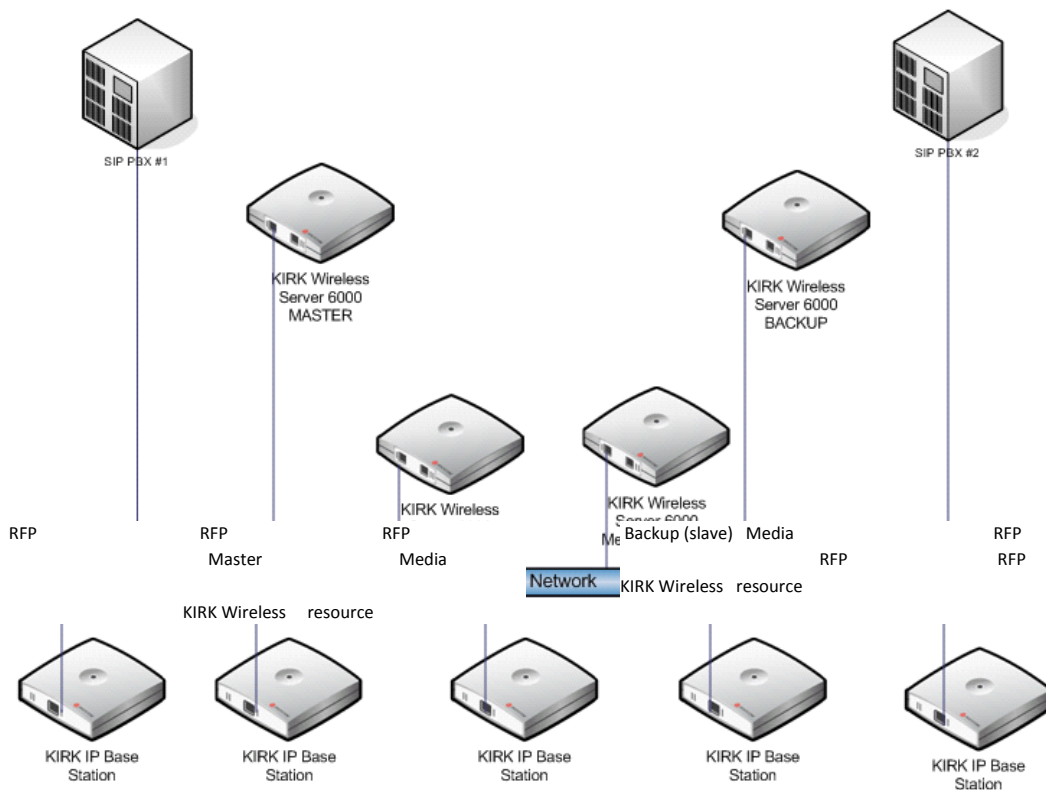
It is required that the backup KIRK Wireless Server has the same firmware revision and licensed features as the master KIRK Wireless Server to be able to connect to the

master. In case a backup tries to connect with a different firmware version or other licensed features than the master, an error message will be logged and the backup will be rejected.

Design

Designing a redundant KIRK Wireless Server 6000 solution is very similar to designing any other redundant network service. In a redundant KIRK Wireless Server 6000 solution, the servers should be connected to separate switches, power groups etc. Figure 1 illustrates an example design of a redundant KIRK Wireless Server 6000 solution including a master KIRK Wireless Server 6000 and a redundant backup KIRK Wireless Server

Figure 1 – Redundancy Setup for KIRK Wireless Server 6000



How This Works

The redundancy feature works as a two-step function, adding the redundancy feature and the load balancing feature to the system. All users will be split up in two sections: a 50% of the users will be registered on the master KIRK Wireless Server 6000 and 50% of the users on the backup server. This is indicated on the user interface in the right hand side under NODE by an M for master server and an S for backup server (see picture below):

✓	1129	Sofa Rasmussen	00077 0506223	KIRK 5020 - 09H	✓	✓	S
✓	1130	Martin Praest	05003 0077763	KIRK Butterfly - 12G	✓	✓	S
✓	1131	Diana Naldal	00077 0930536	KIRK 5020 - 09H	✓	✓	M
✓	1132	Test Håndsaet PM	00077 0461281	KIRK 40XX - 08B	✓	✓	S
✓	1133	Inis Francek	00077 0848751	KIRK 5020 - 12B	✓	✓	S
✓	1134	Heidi	00077 0907453	KIRK 7010 - 09H	✓	✓	M
✓	1135	Jacob Lauritsen	00077 0389623	KIRK 40XX - 08A	✓	✓	S
✓	1135-D	1135-D	05003 0018848	KIRK 6040 - 12B	✓	✓	M

The users will not always be on the same system; after a reboot of the KIRK Wireless Servers some of the users can have changed servers, there is no option to connect a specific user to a specific server, this is done randomly by the system.

This is also the reason why both servers need to have the same licenses installed, because both servers are acting as the same server with one configuration and the backup server is a load balancing server combined with the redundancy feature.

Also note that when a failure is discovered by the system, users, base stations and media resources are switched automatically to the “new” server.

Configuration

In order to enable the redundancy features, a license code with the proper permissions must be installed on both the master and the backup KIRK Wireless Server 6000. Be aware that if a license is installed on the master KIRK Wireless Server 6000, a corresponding license must be installed on the backup KIRK Wireless Server 6000. For example, if a 500 user license is installed on the master, a 500 user license must be installed on the backup as well.

- License required on the master:
14075250 – Software license for master KIRK Wireless Server 6000 redundancy.
When ordering this license, please inform about the ARI code of the KIRK Wireless Server 6000 selected as master.
- License required on the backup:
14075260 – Software license for backup KIRK Wireless Server 6000 redundancy.
When ordering this license, please inform about the ARI code of the KIRK Wireless Server 6000 selected as backup.

Note: Please note that the software license for the backup KIRK Wireless Server redundancy contains an ARI change license (also known as ARI swap license), meaning that the KIRK Wireless Server 6000 redundant solution only refers to the ARI code of the master KIRK Wireless Server 6000, and not the ARI code of the backup KIRK Wireless Server 6000. For more information, please see section Administration Scenarios.

Configuration of the redundancy feature is performed in the Configuration > Redundancy menu.

Configuring a Master KIRK Wireless Server 6000

The master KIRK Wireless Server 6000 must be configured as a normal single server solution with base stations, media resources and users as “normal” and it must be verified that the desired functionality is working before enabling the redundancy feature, and the backup KIRK Wireless Server 6000 is added. When this is done please go to Configuration and redundancy tap in the Web GUI, set node type to “Master” then enter the Fixed IP address for the backup KIRK Wireless Server 6000, set the failover time, then press save and system should be ready.

Configuring a Backup KIRK Wireless Server 6000

On the backup KIRK Wireless Server 6000 only basic network settings and redundancy settings need to be configured. All other settings are retrieved from the master KIRK Wireless Server 6000. Set the backup node type to ‘Slave’, configure the IP address of the master and then reboot the KIRK Wireless Server 6000. Following this step, all other configuration settings will be unavailable on the GUI.

Note: Please note that if the internal corporate phone book feature on the KIRK Wireless Server 6000 is to be used together with the redundancy feature, the corporate phone book needs to be configured for LDAP. If the internal corporate phone book is configured to use a comma separated file, it will not be compatible with the redundancy feature.

Server Settings

The following server settings must be used to configure the redundancy features:

Setting	Configuration key	Description
Failover time	redundancy.failover_time (integer)	The time in seconds from the KIRK Wireless Server 6000 detects a failure until it initiates a failover operation. (See the fact box Failover time conditions on the following page).
Peer node	redundancy.peer (string)	The hostname or IP address of the peer KIRK Wireless Server 6000. The peer address signifies the other KIRK Wireless Server 6000 in the solution, i.e. on the master server, it must be set to the address of the backup (slave) KIRK Wireless Server 6000, and on the backup server it must be set to the address of the master KIRK Wireless Server 6000.
Database UUID	redundancy.database_uuid (string)	Unique ID of the distributed database of the solution, which must match for replication to be performed. When reset on the master server, the UUID is automatically generated, and when reset on the backup server, it is retrieved from the master server. The

		UUID must be reset when a master KIRK Wireless Server 6000 is changed to a backup KIRK Wireless Server 6000 or when a backup KIRK Wireless Server 6000 is moved to another solution.
Setting	Configuration key	Description
Mode	redundancy.mode (string: single/master/slave)	The mode of the KIRK Wireless Server 6000: Either a normal single server solution, a master or a backup (slave) in a redundant solution.

Base Station and Media Resource Configuration

The base stations and media resource should be configured just as in a single KIRK Wireless Server 6000 solution, and the server address should be set to the address of the master KIRK Wireless Server 6000. After connecting to the master KIRK Wireless Server 6000, the base stations and media resource will automatically be configured to connect to the backup KIRK Wireless Server 6000. In the event that the master KIRK Wireless Server 6000 fails, they will continue to provide service to the backup KIRK Wireless Server 6000.

Administration Scenarios

This section describes a common configuration scenario as well as some common administration scenarios where either the master or the backup KIRK Wireless Server 6000 fails.

Upgrading an Existing KIRK Wireless Server 6000 Solution into a Redundant Solution

When ordering a redundancy license to an existing running KIRK Wireless Server 6000 solution, please remember to inform about the existing KIRK Wireless Server 6000 ARI code and the NEW backup servers ARI code, to make sure that the master redundancy license code is not generated to the wrong server. All handsets need to be re-subscribed if this happens because the backup servers ARI code will be changed to match the master server, and the whole redundant system refers to the ARI code of the master after the licenses have activated. And if the two servers license codes have been generated incorrectly the re-register of all handsets has to be performed, and also a complete reconfiguration of the master server.

Temporary Failure on the Master KIRK Wireless Server 6000

In the case where the master KIRK Wireless Server 6000 fails due to loss of power, network connection etc., the backup KIRK Wireless Server 6000 will continue to provide service after a short failover time (see the fact box Failover time conditions). When the master KIRK Wireless Server 6000 returns to operation, it will resume its normal operation in cooperation with the backup KIRK Wireless Server 6000. However, during the failover situation, it will not be possible to change any configuration settings, add or remove users or change the subscription state of any handset.

Permanent Failure on the Master KIRK Wireless Server 6000

If the master KIRK Wireless Server 6000 has been damaged, lost or had its data erased, it will have to be replaced by the backup KIRK Wireless Server 6000 in order to return the system to normal operation mode. This is done by promoting the backup KIRK Wireless Server 6000 to 'Master' and the backup server will then assume the responsibilities of a master server. The repaired or replaced master server can then be added as a new backup server, following the above procedure of setting up a backup KIRK Wireless Server 6000.

Please be aware that if for some reason a repaired or replaced former master KIRK Wireless Server 6000 is re-instated as master, it should be done very carefully. First, it must be configured as a backup KIRK Wireless Server 6000 in order to get the current user data and configuration from the acting master KIRK Wireless Server 6000 (i.e. the original backup server). Subsequently, when all data are replicated from the acting master to the original master, the acting master can be demoted to backup server, and the acting backup server (i.e. the original master) can be re-instated as master KIRK Wireless Server 6000.

Failover time conditions

The default failover time is 15 seconds; however this may be adjusted in the Failover time setting (see Server settings above).

A failure is detected within 15 seconds, and the server will wait the specified failover time before initiating the failover operation.

The failover operation moves the users handled by the failing peer to the working peer by re-registering them to the PBX.

When re-registration is completed, the users are able to receive calls again. Outgoing calls can be performed shortly after the failover.

The speed of re-registration depends on the PBX, and the load on the system. However, for a system with 4000 users the re-registration is expected to be completed within $4000 / 2 / 100 = 20$ seconds.

Failure on the Backup KIRK Wireless Server 6000

A failure of the backup KIRK Wireless Server 6000 will induce a short service outage, and the master KIRK Wireless Server 6000 will reestablish full operation as a single server solution. If the backup KIRK Wireless Server 6000 resumes its operation, it will automatically return to be part of the redundant system. In case the backup KIRK Wireless Server 6000 has to be replaced, the new backup KIRK Wireless Server 6000 must be added to the solution, just as described above.