Cellular failover service definition

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1) Service Overview

The Cellular Failover Service provides a cost-effective back-up option for Customer sites that have a Redcentric primary managed Broadband connection. The Service is designed to provide a cost-effective solution to support a Customer's business critical applications given the capabilities and limitations of the mobile phone/data networks. A supplied router with a cellular radio interface is permanently deployed on the Customer site usually adjacent to the broadband router. This provides protection against failure of the broadband line or router. The cellular router connects to the mobile network using 4G where available and at lower speeds otherwise. Redcentric ensures that both the broadband & cellular routers and all network components are configured to work together. Redcentric monitors and supports the components and Customers are notified when the back-up is in use. The Cellular Failover Service includes a cellular SIM and data bundle.

2) Service Description

2.1) Associated Products and Dependencies

The Cellular Failover Service is designed to integrate exclusively with Redcentric's suite of connectivity options. The Service is permanently deployed to minimize down-time and is not offered as fast, short-term deployment.

2.2) Technical Solution Overview

Virtual Router Redundancy Protocol (VRRP) is used to provide a gateway address on the cellular and broadband routers for devices on the Local Area Network (LAN). Ordinarily the broadband router will adopt the VRRP address. Upon failure of the broadband Service or router, the cellular router adopts the address.

If the WAN design incorporates an SD-WAN overlay, the Cellular Failover Service essentially delivers Internet connectivity, and the SD-WAN equipment builds IP-sec secured tunnels between end-points over the Internet.

If the WAN design does not incorporate an SD-WAN overlay, the Cellular Failover Service essentially delivers Internet connectivity, and IP-sec secured tunnels are created between the cellular CPE and VPN-concentrator infrastructure in the Redcentric core.

In both cases, an IP-sec tunnel is additionally configured between the cellular router and the Redcentric core for back-up management and reporting.

Within the core, dynamic routing protocols are configured to route Customer traffic over the cellular link automatically when failure of the primary connection is detected and to swing the traffic back to the primary when it is re-established.

2.3) Application Filtering

Redcentric cannot influence throughput (bandwidth) of the Cellular Failover Service as this is largely determined by mobile cell usage, contention, signal strength, and network technology, etc. Therefore, to offer the best possible performance, Customers may choose to restrict the traffic across the cellular network connection so that only business critical applications are supported.

In order to restrict application traffic on the back-up link, that traffic must be able to be filtered based on source/destination addresses. This classification and filtering is performed in the cellular router.

2.4) Cellular Router

If the firmware or hardware version of your Cellular Router is forecast to become End of Support (EoS) / End of Life (EoL) during a renewal of that contract term, Redcentric will no longer be able to provide security or critical firmware updates for that EoS or EoL CPE.

In order to continue to receive security and critical updates, a hardware refresh of the CPE will be required. Any hardware refresh, including the provision of new CPE, is outside the scope of this Service and will be chargeable. A new Cellular Router would need to be provided by Redcentric for an additional charge.

2.5) Installation

Redcentric offers 3 installation options:

- Redcentric engineers perform a basic installation of the cellular router adjacent to the broadband router and position an antenna within the same room. This will be the basic Cellular Failover Service and included in the set-up charge. The pricing for the Service assumes that for any roll-out project, two sites can be installed per day; if this is not possible, additional Charges may apply. Redcentric cannot guarantee that coverage will be available or acceptable and the next option may also be required at additional cost.
- Redcentric will arrange for a specialist contractor to deliver an optimised connection using a higher gain or amplified antenna. This will only be required when the Redcentric install does not offer the level of coverage required. Again, even though this option will be chargeable, Redcentric cannot guarantee that

coverage will be available or acceptable. The Customer has the option to cancel the Cellular Failover Service if acceptable coverage cannot be achieved.

• The Customer installs the cellular router and/or antenna. This is only an option for big roll-outs when both parties agree that installation is straight-forward, the Cellular Failover Service works almost every time and there are no problems with coverage (as a result of experience from installing a number of sites using the options above). This option attracts a lower set-up charge.

During site installations, Redcentric will need to test fail-over and this will disrupt the primary connection. A brief outage of approximately 30 minutes will be required during the working day (at an agreed time) to test failover & systems on back-up. If this is not acceptable, an out of hours install can be arranged at extra cost.

If environmental conditions change during the contract period and acceptable signal level is lost, re-installation / relocation of the antenna would be required.

2.6) Customer Responsibilities

The Customer is responsible for:

- Provision of a suitable location for the router including mains power and space etc.
- Taking appropriate precautions to prevent the router and antenna from being obscured, damaged or moved.
- Appropriate configuration of the LAN (local area network) to allow communication between primary and cellular CPE
- Periodically fail-over testing

2.7) Redcentric Responsibilities

Redcentric is responsible for the following:

- Deployment of the cellular router on the Customer site
- Installation of the antenna according to the option selected
- Configuration of the broadband & cellular routers
- Configuration of the core components
- Monitoring of routers and core devices
- Notification to the Customer when the back-up connection is in use
- Fault management & investigation

If a problem affects the Cellular Failover Service, the following table sets out the party responsible for the costs of corrective work.

Identified Problem	Responsibility for costs	Cost incurred
Faulty router or antenna	Redcentric	Site visit & replacement
Incorrect solution configuration	Redcentric	As required to correct problem
Faulty SIM / contract issue	Redcentric	As required to correct problem
Antenna, cable, or router damaged, relocated etc.	Customer	Site visit & replacement (if required)
Local environment	Customer	Site visit & new set-up if required
Other Customer related fault or issue	Customer	Site visit & other associated costs

2.8) Monitoring

Redcentric polls the cellular router every five minutes or so and establishes the following:

- That the device is functioning and is connected to the CPE terminating the primary circuit
- That there is a session connection from the cellular CPE to the cellular network IP-layer.

Lack of response to several successive polls automatically triggers the creation of a fault ticket, and the issue is investigated by a Redcentric engineer.

Additionally, signal strength can be monitored manually as part of the diagnostic procedure.

2.9) Reporting

No reporting information is available to Customers. Redcentric service management staff can access a list of pollloss events to help identify trends.

2.10) Fault Notification

Redcentric notifies Customers of fail-over and fail-back using automated email/SMS alerts using similar processes & procedures and the same Network Operation Centre as is used for other connectivity services.

Redcentric detects failure of the primary connection and notifies Customers of this automatically. Redcentric detects that back-up has initiated but it is not possible to confirm that Customer data is using the back-up link as intended. If a Customer determines that the systems at a site are not working as they should in back-up mode, the Customer is required to raise a fault ticket with Redcentric for further investigation.

Redcentric technical staff can log on to the cellular router during back-up to perform fault analysis, but this is used only when necessary to leave the majority of bandwidth for use by the Customer applications.

2.11) Latency

Redcentric regularly experiences one-way latency in the order of several hundreds of milliseconds. Redcentric is largely unable to affect these figures as they are a function of the cellular network. Customers should check that their applications will function adequately with latency of this order of magnitude.

2.12) SIM Provision and Data Utilisation

The Cellular Failover Service includes a mobile SIM with data bundle. The data bundle is sufficient for the purposes of backing up broadband connections which, under normal circumstances, would be available 99+% of the time. If the Customer, by some action (e.g., disconnection of the broadband router), causes excessive traffic to be sent over the cellular network, the Customer may be charged for the exploratory work and the excess data transfer.

2.13) Mobile Operator Selection

Redcentric will deploy either a single-net SIM from one of the major UK operators (3, O2, Vodafone or EE) or a multi-net SIM which is supported on several of these networks. The latter option simplifies deployment and generally provides greater cellular availability.

2.14) Mobile Operator Performance

Redcentric has no control over mobile network coverage, individual cell site availability or bandwidth throughput at any point in time. Consequently, no performance assurances are offered.

3) Implementation and Acceptance

3.1) Acceptance Criteria

The following are the Acceptance Criteria applicable to the Cellular Failover Service:

Assuming test traffic is not filtered -

- With primary circuit working, traceroute to a known address confirms that traffic is traversing primary circuit
- With primary circuit disconnected, and after waiting 5 minutes, traceroute to a known address confirms that traffic is traversing the cellular link
- With primary circuit reconnected, and after waiting 5 minutes, traceroute to a known address confirms that traffic is traversing the primary circuit

4) Service Levels and Service Credits

There are no Service Levels or Service Credits applicable to the Cellular Failover Service.

5) Data Processing

5.1) Data Processing Scope

- The Cellular Failover Service delivers the transport of IP packets between locations.
- The Cellular Failover Service does not involve any storage or backing up of data.

5.2) Data Storage and Encryption

- Redcentric encrypts traffic over connections when a public (i.e. Internet based) cellular service is used.
- Redcentric does not capture, inspect, analyse, store or share the customer's traffic/data under normal circumstances.
- Under certain circumstances, when managing a support ticket, Redcentric may capture, inspect, analyse and/or store a small sample of the customer's traffic in order to investigate and diagnose a very specific problem, e.g. to help resolve a problem relating to IP packet corruption. Such diagnosis would involve the examination of a small sample of IP packets.

5.3) Data Processing Decisions

- Redcentric does not make any data processing decisions in relation to the Cellular Failover Service. Any
 processing of data over Customer systems when using the Cellular Failover Service for transit is
 instigated, configured and managed by the Customer.
- Redcentric Support can be asked by the Customer to intervene in the event of an issue with the Cellular Failover Service. In such a case Redcentric may make decisions that affect data processing, but such actions will only be undertaken at the request of and in conjunction with the Customer.

5.4) Sub-Processors

- Redcentric's network over which elements of the Cellular Failover Service is delivered uses third party carriers (E.g., O2, Vodafone or three) to provide connectivity. These third parties are conduits only for data and have no involvement in the processing or storing of data.
- No other parties are involved in delivering the Cellular Failover Service, and there are no subprocessors appointed by Redcentric.

5.5) Customer Access to Data

• The Customer controls its own platforms which use the Cellular Failover Service to carry data, and the Customer therefore has full access to its own data.

5.6) Security Arrangements and Options

• The core Infrastructure delivering the Cellular Failover Service is hosted at both Redcentric and thirdparty locations. All locations meet physical security standard ISO27002 section 11.1 or equivalent. The Customer is responsible for ensuring the physical security at customer sites/locations, where the Service terminates, meets its needs.

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