RACK INSTALLATION
Best Practice Guide

N E X T D C

Overview

Welcome to NEXTDC.

Our role is ensuring you operate efficiently, with increased resilience.
This best practice installation guide has been created to help you establish a
best-in-class rack configuration that aligns with NEXTDC's facility rules.

Once installation is complete, return this document to the onsite facilities team who
will review the installation and provide guidance if required.

Power Rail Best Practice

Where equipment is installed correctly, NEXTDC provides a 100% uptime guarantee that power is always supplied to either the A feed or the B feed. During standard operating scenarios, power will be delivered to both power feeds. In rare circumstances, such as maintenance scenarios, NEXTDC may be required to take one power feed offline for a short period. Failures within your equipment, such as a failed power supply, could also impact one of the power feeds to your rack.

> Follow the below steps to ensure your environment operates at the highest resilience levels and to reduce your risk of an outage.

Dual Power Supply Equipment

NEXTDC provide you with an A and B power supply. Please use both supplies where possible.

Dual power supply equipment should be used with one power supply connected to the A feed and the second power supply connected to the B feed.

Connect to Power Supply A

Connect to Power Supply B
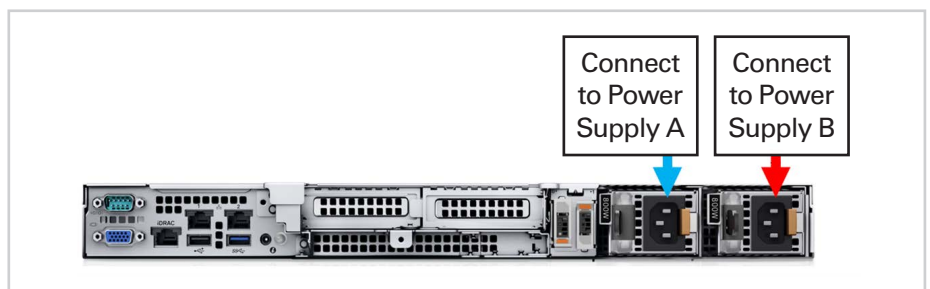
Power Rail Utilisation

At a minimum, NEXTDC provision an A power rail and a B power rail. These are mounted on opposite sides of the rack unless otherwise requested. NEXTDC's Tier III and Tier IV electrical design ensures that engineered redundancy is present across separate power supplies.

Utilising both power sources is essential to achieve redundancy.

Per the configuration example shared, if the B power rail failed, the second server would lose power, whereas the first server would continue to operate as normal.

- Devices must only be connected to power sources within the rack that they are mounted in
- Devices must not be powered from adjacent racks.

Doing so poses a risk to safety and reduces redundancy.

Redundancy Maintained - Good Installation

Redundancy Lost - Poor Installation
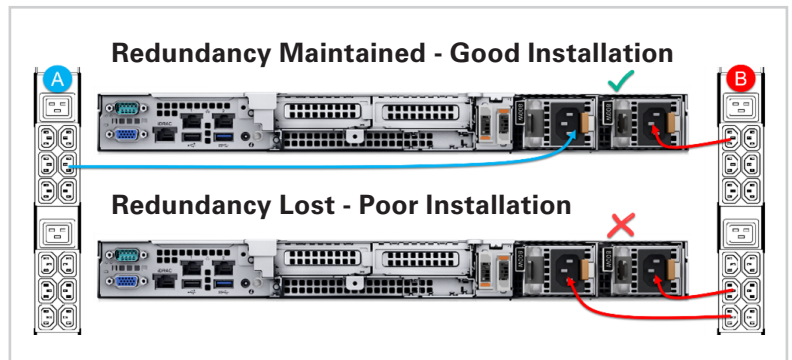
Power Rail Balancing

During setup, ensure you balance the IT load to avoid cascading failures. A cascading failure is where one power source fails and the load on that power source is transferred to the other power source. The combined load causes the second power source to overload and trip its circuit breaker. The cascaded failure event means both power sources become non-operational.

In the examples below, kW and Amps are both used. There is a relationship between Voltage, Amps, Power Factor and kW, however, it's beyond the scope of this document. In this document a 16A circuit breaker can support approximately 3kW allowing for a small safety margin.

To reduce the risk of power failures, balance your IT loads with consideration given to two areas:
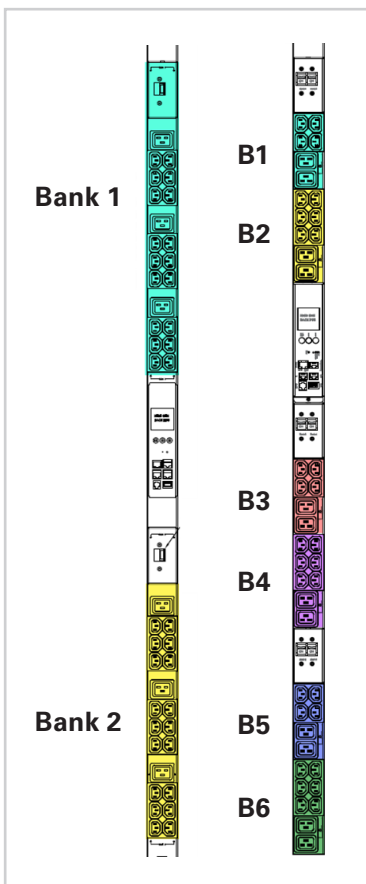
Balancing the power banks within each power rail

- For Single Phase 32A power rails (left rail image), the power rail is internally separated into two separate 16A banks, each with their own circuit breaker. The top half of the rail is one 16A bank and the bottom half the other 16A bank.
- For Three Phase 32A power rails (right rail image), the power rail is internally separated into six separate 16A banks each with their own circuit breaker.
- For both power rail types, avoid overloading a single bank by ensuring that your devices are spread evenly across all banks. Exceeding a single bank's circuit breaker capacity will cause that circuit breaker to trip. This may occur even where you are drawing less power than contracted or less than the rail can support in total across all banks. Balancing the load will help prevent this occurring.
- Each power rail has a LCD monitor that will show you the aggregate load and load per bank. Ensuring that you are less than half for each bank will provide spare capacity if the other power supply is impacted and the IT load is transferred.

Single Phase	Three Phase
1.10 kW → Aggregate Load	← 6.00 kW
Per Bank Load	
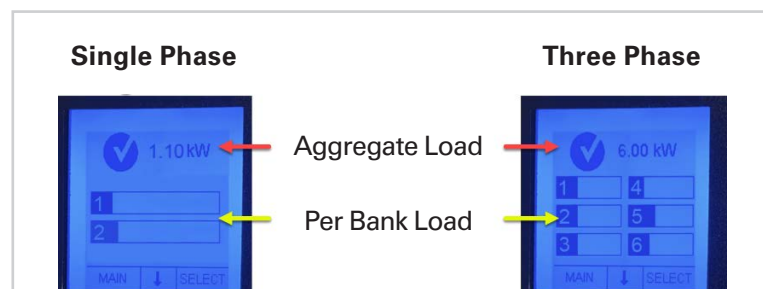
Balancing the power rails within the rack

At a minimum, NEXTDC supply two independent and isolated feeds: A and B. This provides redundancy but also means it's possible to install IT load in the rack that exceeds an individual power rails capacity. Doing so will put you at high risk of cascading failures should there be an issue with either supply. To prevent the total power being too high with a risk of cascading failures, ensure the installed IT load is managed and spread across the rails and banks.

Single Power Supply Equipment and Static Transfer Switches

Using equipment with dual power supplies is strongly recommended. If your equipment only has a single power supply, a rack mounted Static Transfer Switch (STS) can provide a form of redundancy.

In the event of a power failure on one feed, the STS will automatically transfer the load to the other incoming power feed without interruption to equipment. The single power supply IT equipment will then have increased redundancy when compared to only using a single power feed.

> ⚠️ Devices with a single power supply have a single point of failure. Utilising a STS introduces an additional single point of failure, however this approach reduces the overall likelihood of a system impacting issue.
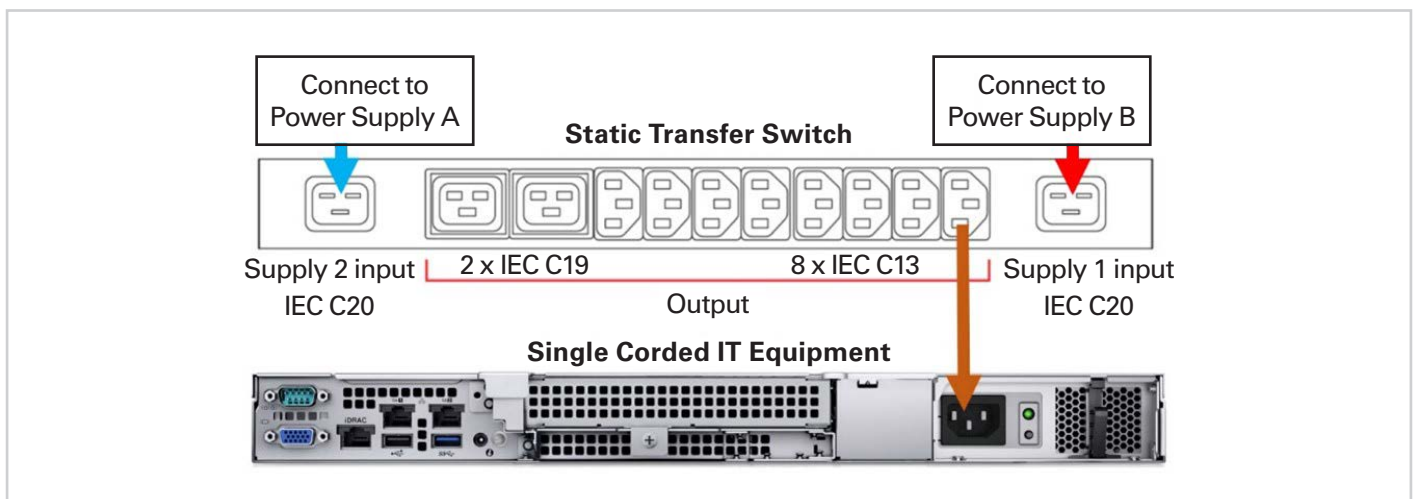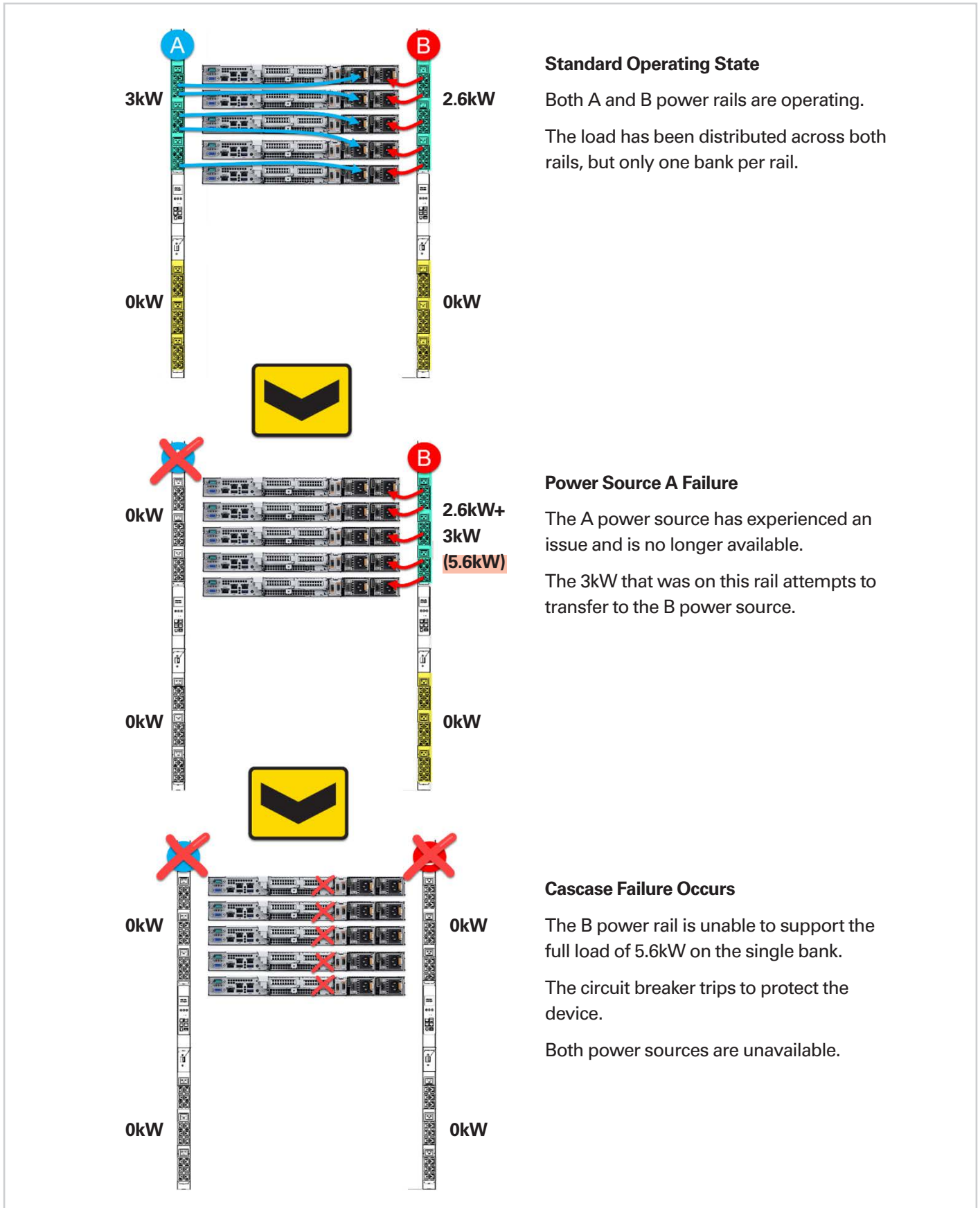

STS units can be requested via ONEDC. If providing your own STS, written permission from NEXTDC is required to ensure the unit has overlapping switching of the neutral conductor.

Cascading failure example

A single phase rack has an IT load of 5.6kW. The IT load has been installed in an unbalanced fashion with all of the servers installed into Bank 1 of the power rails, with no load distributed across Bank 2.

The diagram illustrates a cascading failure in three steps.

Standard Operating State

Both A and B power rails are operating.

The load has been distributed across both rails, but only one bank per rail.

3kW   **2.6kW**

0kW   **0kW**

Power Source A Failure

The A power source has experienced an issue and is no longer available.

The 3kW that was on this rail attempts to transfer to the B power source.

0kW   **2.6kW+ 3kW (5.6kW)**

0kW   **0kW**

Cascase Failure Occurs

The B power rail is unable to support the full load of 5.6kW on the single bank.

The circuit breaker trips to protect the device.

Both power sources are unavailable.

**0kW**   **0kW**

0kW   **0kW**

Airflow Containment Installation Best Practice

It's mandatory to follow airflow installation best practices to maintain optimal levels of efficiency and sustainability. Failing to do so will mean cool intake air is mixed with hot exhaust air - creating warm intake air.

Your environment may be impacted and data centre efficiency will be reduced.

The steps below will ensure your installation promotes the best environment for your equipment; is compliant with facility rules; and, will not require adjustment or re-installation.

- Ensure all equipment is installed with the airflow intake drawing air from the cold aisle and exhaust air directed to the hot aisle. NEXTDC standard racks have blue doors for cold intake air aisle and red doors for hot output air aisles.
- Ensure any open gaps in the rack are filled with blanking panels supplied by NEXTDC. These can be found in bins at the perimeter of the data halls.
- Brushed grommets exist on the sides of each rack. These are to be used for cables running from the front to rear of the rack. If cables run through any RU space, brushed panels must be used. Brushed panels are the responsibility of customers, alternatively NEXTDC can provide these for a nominal fee. Failing to re-install blanking panels may require you to return to site to install or be charged for NEXTDC to re-install them on your behalf.
- Where equipment has air exhausting to the side of the unit, you are responsible for ensuring appropriate mechanisms are in place to prevent exhaust air from recirculating to the cold aisle. Manufacturers of such devices often have adapter panels that route the air correctly. These can be purchased directly from the manufacturer.
- Some devices may allow you to change the fan flow direction in the settings or physically reverse the fan mount to ensure you meet the cooling requirements. Check the settings of your device if applicable.
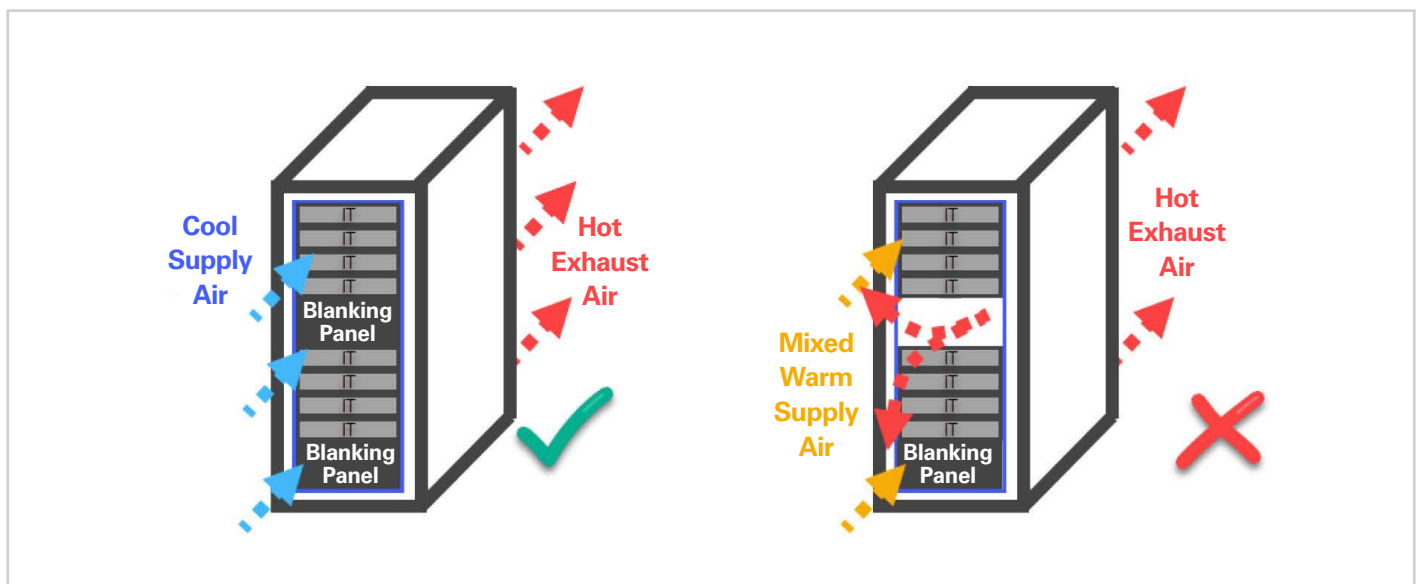
Support

Following the above steps will help to significantly reduce the risk of adverse impacts to your environment.

Remote Hands support and comprehensive onsite technical assistance is available through ONEDC.

If you have any questions or concerns, contact our Customer Experience Team on **1300 698 677** or email us at **info@nextdc.com**. Alternatively, use the handset located in your data hall to speak directly to a Customer Service Representative.

NEXTDC Remote Hands Services

DELIVERY ASSISTANCE

Unpack
Unpack/un-crate deliveries

Inventory reporting
Full equipment inventory on deliveries received

Condition report
Full inspection and condition report on deliveries received

Delivery reconciliation
Reconciliation and report on goods received

Deliver to rack/cage
Deliver received goods to rack/ cage

Deliver to locker/storage
Deliver to assigned locker or storage space

Pack - ready to ship
Re-package equipment ready for shipping

TECHNICAL ASSISTANCE

Visual assistance
Visual verification to identify specific or general requests or concerns

Power rail reading
Detailed readingsof power rails

Rack/compliance audit
Full audit of equipment in rack(s)

Toggle switches
Flick/toggle switches/ buttons

Power cycling: Hard
Hard power reset

Power cycling: Soft
Soft power reset

Guided config assistance
Minor guided remote configuration assistance

EQUIPMENT ASSISTANCE

Custom installation
Custom installations of equipment provided, or received as part of a delivery

Equipment: Relocation
Relocate equipment within rack/ space

Equipment: Removal
Remove equipment from a rack/ space

Equipment: Swap
Swap out equipment from a rack/space

Equipment tagging
Label and inventorying rack equipment

Equipment audit
Full audit of equipment inside rack/space

Remove media
Remove media from storage equipment

Insert media
Insert new media into storage equipment

Interface card: Installation
Install interface cards into equipment

Interface card: Removal
Remove interface cards from equipment

Spare Parts: Power leads
Supply IEC standard power lead

Spare Parts: Adaptors
Supply IEC to AUS 3 pin adaptor

GENERAL RACK ASSISTANCE

Rubbish removal
Remove rubbish from rack/ space

Rack tidy
Tidy rack/space

Repair containment
Repair rack containment

Blanking panels: Install
Additional blanking panel installation

Blanking panels: Supply
Supply blanking panels

Site escort
Escort guests, customers, staff or contractors to your data centre space

EXTRA HANDS

Packing assistance
Assist with packing up equipment

Unpacking assistance
Assist with unpacking equipment

Installation assistance
Assist with equipment installation

Cabling assistance
Assist with assembling, installing or maintaining cabling

Rubbish removal
Assist with rubbish removal

AV and Conferencing
Assist with setting up AV and conferencing equipment

Equipment removal
Assist with equipment removal

Technical troubleshooting
Technical troubleshooting assistance

CABLING ASSISTANCE

Tx-Rx swap
Swap cross connect Tx and Rx

Demarcation: Verify
Full test from demarcation point to carrier demarcation point

Demarcation: Patch
Patch from demarcation point to equipment

Demarcation: Move
Move FOBOT

Cable audit
Full cabling inventory and audit

Inter-rack cabling
Inter-rack cabling assistance

Patch cables
Cable patching

Patch panel installation
Install provided patch panels (or similar)

Remove cables
Remove cabling

Replace cables
Swap and replace rack cabling

Secure cables
Secure rack cabling

Label cables
Cable inventory and labelling

Cable trace
Trace cable and identify A and B ends

Cable management
Install or modify cable management

Continuity testing
Continuity testing for fibre and copper cables

Tidy cables
Tidy cabling

Cable troubleshooting
Troubleshoot physical cabling issues

Spare parts: Cables
Fibre Optic (Single Mode or Multi Mode)

Spare parts: General
Supply general materials for fixes and remediations such as cable ties, Velcro etc

NEXTDC where the cloud lives™   13 NEXT   sales@nextdc.com   www.nextdc.com