

Report

Radboud university medical center

Information Management

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Connection Requirements

Infrastructure

Date

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Properties

Connection Requirements

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Approval

No.	Date	Approver
1.0	21-04-2016	Supply of MT information management

Overview of changes

No.	Date	Action	Author
0.9	09-02-2016	Setup of Connection Requirements	Robert Vermeulen / Tom Driessen
1.0	21-04-2016	Final version of connection requirements	Tom Driessen

1 Introduction

1.1 Background

Information Management (IM) delivers information and communication technology (ICT) resources and services for the purposes of patient care, research, education and the supporting components within Radboud university medical center, as well as for the benefit of its partnerships.

In order to ensure quality, continuity and the security of the ICT facilities, requirements have been set by IM that apply to ICT resources to which individuals wish to connect on the Radboud university medical center infrastructure. The ICT infrastructure covers hardware, operating system software, telephony, networking facilities, office automation software, DBMS software and data storage.

1.2 Objective

The connection requirements describe the rules that apply to ICT resources and connecting ICT resources on the infrastructure of Radboud university medical center.

These rules are needed to ensure the quality, continuity (availability) and security of this infrastructure.

1.3 Ownership

The ownership of this document is invested by the infrastructure manager of the Department of Information Management of Radboud university medical center.

1.4 Adoption and modification

1.4.1 Connection Requirements

The connection requirements have been formally adopted by the Management Team (MT) of IM of Radboud university medical center. Alterations or modifications to the requirements take place as soon as technical or other developments make this necessary. In such a case, a proposal will be presented to the MT.

1.4.2 Exceptions

Exceptions to the requirements laid down in this document, may be requested in advance through an electronic written and motivated request. This exemption will be reviewed through the Architectural Board and, in case of approval, this will be linked back to the applicant.

1.5 Publication

These connection requirements have been published on Radboud university medical center Intranet, with reference to the version number and date of adoption. When purchasing ICT resources, these requirements can be provided to suppliers.

2 ICT Infrastructure Connection Requirements

This document describes the interfaces in the ICT infrastructure which can be connected. The interfaces are all based on market standards and are specified in this document for different implementation solutions.

Radboud university medical center has 4 different implementation strategies, each with its own connection requirements for the interfaces. To determine which connection requirements apply, the reader should follow the flowchart. It is possible that the integrated solution is made up of multiple scenarios. If applicable, the reader should go through the flowchart for each solution. The flowchart uses colors for categories that correspond to the appropriate category in the Annex (Excel file).

2.1 Workstation

The Department of Information Management offers a standardized workstation for all employees of Radboud university medical center. Because the Radboud university medical center organization consists of different domains, Healthcare, Education and Research, with their own expectations, the workstations have been customized accordingly.

The Radboud university medical center workstation consists of 2 variants, a managed Windows 7 workstation with or without Epic Hypervisor software (basic or care workstation, respectively). EPIC is the electronic patient database of Radboud university medical center and most users need access to this software.

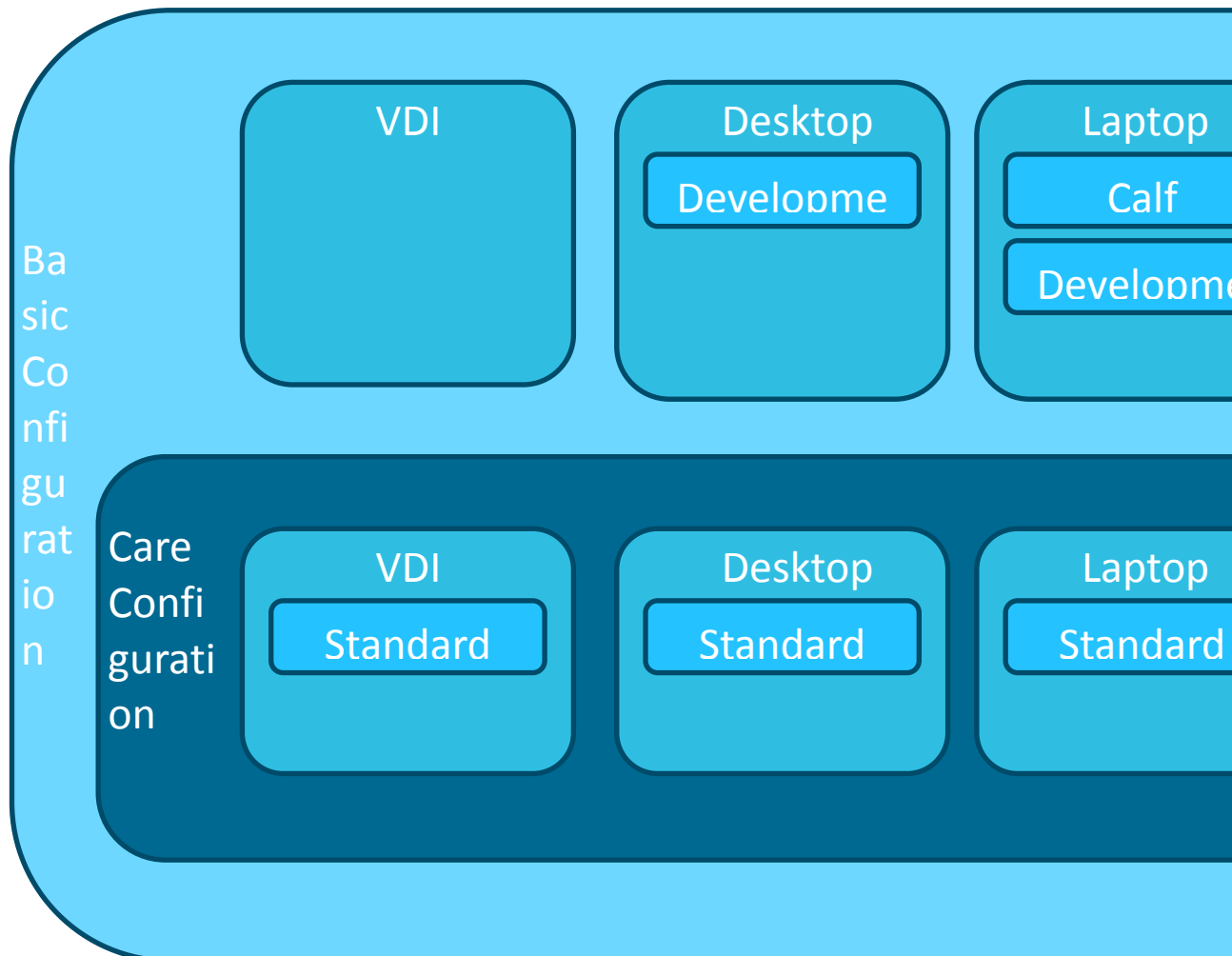
The basic and healthcare workstations are offered on different workstation hardware. For regular workstations, four variants are available:

- The VDI workstation
- The desktop
- The laptop
- The other workstation

Radboud university medical center relies heavily on the use of the VDI workstation to keep administrative costs to a minimum. If an employee needs a desktop or a laptop, these can be requested after receiving prior permission from the relevant manager. In the overview below, the standard workstations that can be requested are listed.

Type of workstation configuration	Characteristics
Standard	The standard workstation configuration is used by the majority of Radboud university medical center users. This workstation configuration is managed entirely by IM. All applications that are offered on this workstation operate through ThinApp application virtualization or are part of the image. An 8-week cycle is built into this workstation configuration, which automatically updates with security or software updates. Applications that can be offered via ThinApp can be made available at all times.
Development	The research workstation is based on the image basis with a limited set of applications. This means that only the generic non-healthcare applications are available (Microsoft Office). The user has the ability to install applications on his own. Logging onto this machine is limited to the user to whom the machine belongs. Other users may not/cannot log on. The key obligation here is that the virus scanner

	and Microsoft Updates are kept updated. Maintenance of this machine will have to be performed by the user himself.
WOW	The Windows computer On Wheels (WOW) establishes a connection to the VDI environment. This workstation does not allow any applications other than the VMWare View Horizon client.

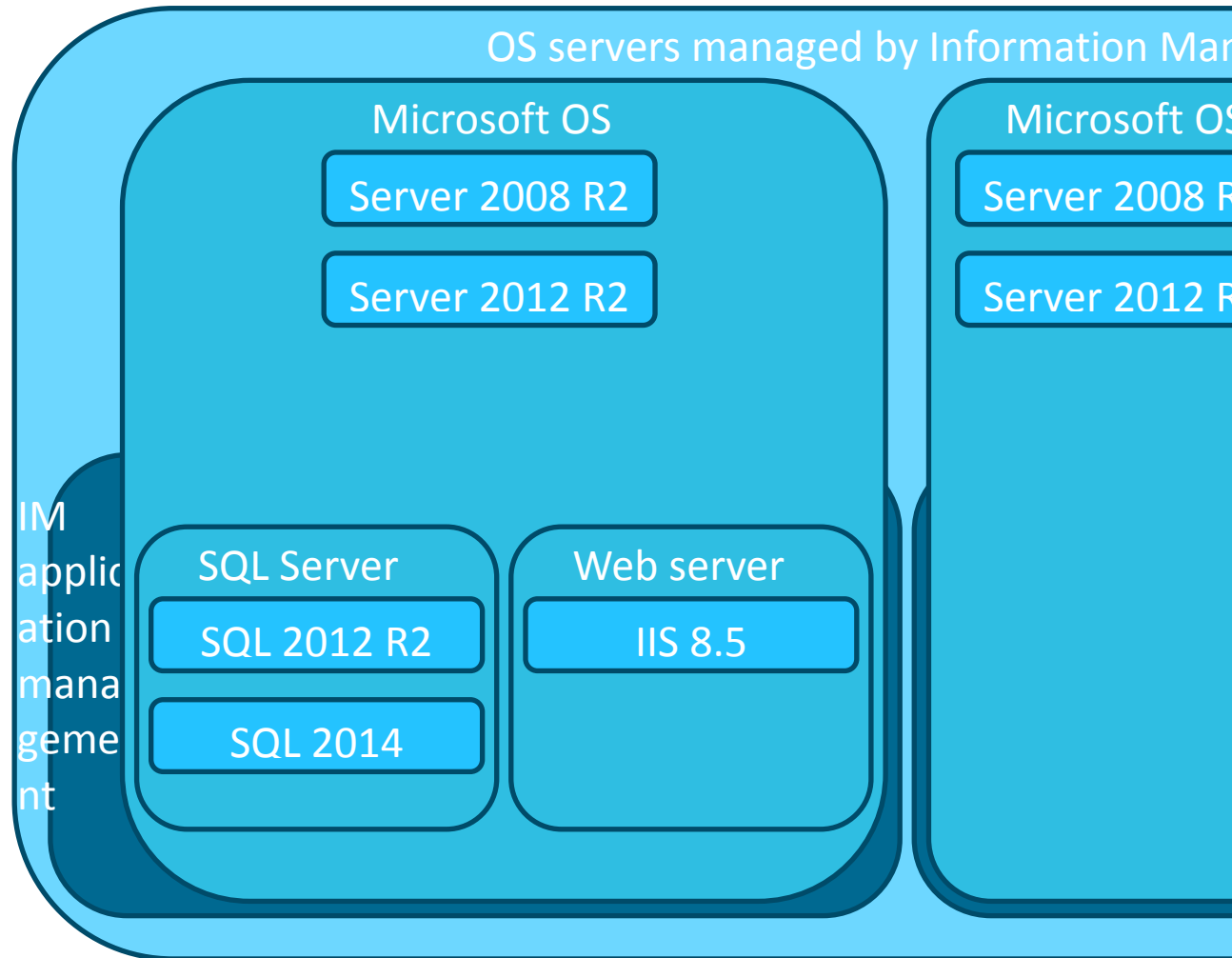


Employees of Radboud university medical center also often have mobile devices; some are private, others have been provided by Radboud university medical center. These workstations also offer interfaces, which are described in the Annex. Private devices of employees can be linked to the Radboud university medical center network in order to use the ICT services. Private devices of guests and patients may be linked to the guest network via WIFI. Radboud university medical center is working on further segmentation of network zones, through which the coupling of private devices to the internal network by employees is set to change in the future. See the Annex for full details.

2.2 Server

Radboud university medical center has two physical data centers on campus, which behave as a single logical data center. Services that have high availability requirements are split between the two data centers. Team Datacenter manages the data centers. Virtual managed servers based on Microsoft Windows servers or Linux technology are available in the data centers. Servers can be purchased as a standard service, in which everything is managed, including at the operating system

level. There are also standard database and web server services available for purchase. These services are offered from a standard Windows or Linux server.



Radboud university medical center uses a configuration model in which, from a security point of view, data and applications have been separated. There are also opportunities to link with the standard e-mail system or to configure a virtual appliance. Access to the data center is exclusively assigned to employees of Team Datacenter and Team Data and Telecommunications. Devices that are meant to be placed in one of the data centers must meet the specified requirements. All details on the standard server services are specified in the Annex.

2.3 SAAS/IAAS

The SAAS/IAAS concept offers Radboudumc users applications and services that are not technically managed by Radboud university medical center staff. The underlying infrastructure associated with the offered application and/or service is not found in a Radboud university medical center data center. It is possible that Radboud university medical center staff performs the functional management of the application and/or service. Such applications and/or services can be made available for Radboud university medical center employees after fulfilling the connection requirements as specified in the Annex.

2.4 Devices with network connections

The Radboud university medical center network is divided into a private and public zone. The public area is accessible for devices that are not managed by Radboud university medical center or that do not contribute to the business processes. Such equipment is not considered a workstation or server but largely a free-standing device that can write data to a receiving station that is also

linked to the Radboud university medical center network. Devices that require a network connection to the private zone shall comply with the connection requirements at all times. Each situation is examined to see if a separate network zone should be created.

2.5 Deviations

Radboud university medical center designed the Connection Requirements to simplify the ICT landscape, through which management and changes can be carried out in a feasible way. By using market standards, Radboud university medical center has tried to minimize the number of exceptions. Radboud university medical center is aware that in exceptional cases, deviations from the standard connections are necessary. These exceptions must be tested in advance by the Infrastructure Architectural Board, in which the relevant domain architects of the Infrastructure Department as part of Information Management take part.

3 Connectivity options

3.1 Workstation

3.1.1 Bring Your Own / Consumer

There are only unmanaged devices in this zone. These are devices that are privately owned or have been provided by Radboud university medical center but which are not actively managed. Users are personally responsible for updating their device with the most recent updates. For this reason, these devices are treated as unknown and unreliable.

3.1.2 Applications offered on the Radboud university medical center workstation

A standard workstation is available on the private part of the Radboud university medical center network. This workstation can be used as a basis for the provision of an application. The application may be managed by Radboud university medical center or a Supplier.

3.1.3 Peripherals linked to a workstation

The peripherals that can be connected to the standard Radboud university medical center workstation. These include hand-held scanners, mice and keyboards, for example. Drivers for such peripherals can be included in the standard Radboud university medical center workstation.

3.1.4 Blackbox

The Blackbox solutions consist of a computer configuration with specific hardware. This computer is completely in the service of this hardware. It can be said that the computer is part of the overall setup. This computer is not considered a regular workstation. Solutions that are classified as Blackbox solutions have their own network zone, within which they operate. Radboud university medical center does not perform any active management on this computer; rather the supplier does. Management agreements must be included in an SLA. Because the computer is connected to the Radboud university medical center network, the supplier must meet the Connection Requirements specified in the Annex.

3.2 Server

3.2.1 Radboud university medical center-managed applications on Windows servers

Within the server environment (in the data center), server applications can be offered on standard servers. These servers are managed by Team Datacenter. On these servers, applications can be installed that are technically and functionally managed by Radboud university medical center.

3.2.2 Radboud university medical center-managed applications on Linux

Within the server environment (in the data center), server applications can be offered on standard servers. These servers are managed by Team Datacenter. On these servers, applications can be installed that are technically and functionally managed by Radboud university medical center.

3.2.3 Radboud university medical center-managed MS SQL instances on Windows servers

Radboud university medical center offers the possibility to purchase an SQL instance as a standard service. This instance is actively managed. The preferred solution is to incorporate the SQL instance into an existing shared SQL server. If necessary, a specific SQL server can also be delivered with an SQL instance.

3.2.4 Supplier/department-managed MS SQL instance on Windows, with a Radboud university medical center license.

Radboud university medical center offers the possibility to install an MS SQL instance delivered by Information Management with a Radboud university medical center license. This instance is subsequently not managed by Information Management.

3.2.5 Radboud university medical center-managed IIS Website on Windows

Radboud university medical center offers the possibility to purchase a standard web server. This web server comes with Internet Information Services and is actively managed. The preferred solution is to incorporate the web application into an existing shared web server. If necessary, a specific web server can also be delivered.

3.2.6 Supplier/department-managed applications on Windows servers

Within the server environment (in the data center), server applications can be offered on standard servers. The server is provided by Information Management and is actively managed to the operation system level, this includes operating system patches, antiviruses and backups. The applications that will be installed on this platform are not managed by Information Management.

3.2.7 Radboud university medical center-managed applications on Linux

Within the server environment (in the data center), server applications can be offered. These are the Linux applications managed by Radboud university medical center.

3.2.8 ESX appliance

Appliances that are supplied to serve Radboud university medical center must be implemented virtually and use the Radboud university medical center VMware ESX environment. If the appliance supports the availability of a VMware ESX service, then the appliance must be implemented in a redundantly physical way. The management of the virtual appliance's operating system is performed by Team Datacenter, unless it is a Team Datacenter appliance. Additional management agreements must be made regarding this management.

3.2.9 Blackbox

Devices that should be placed in Radboud university medical center's data center, but are not managed by Radboud university medical center, will be considered a Blackbox. The devices will be placed within a closed network. For physical connection requirements, please refer to the Annex.

3.3 SAAS/IAAS

3.3.1 Externally hosted applications and/or infrastructure

SAAS and IAAS solutions are characterized in that they are located remotely and are technically managed by a third party. Their functional management can however be provided by Radboud university medical center. Even if a SAAS or IAAS solution is not within the network of Radboudumc, connection requirements have still been designed to offer users a clear authentication process and to allow Radboud university medical center to exercise control over access to information.

3.4 Devices with network connections

3.4.1 Devices with network connections

Devices that require a network connection in the private part of the network must all meet the connection requirements. These devices are operated by third parties and harmonization with Information Management is necessary. These devices are not included in the Active Directory. In the case of workstations which control (medical) equipment, these workstations are considered part of the unit that it controls. A separate network zone has been created in the closed zone for maximum insulation.

4 Framework requirements

Various requirements apply to each individual connection option.

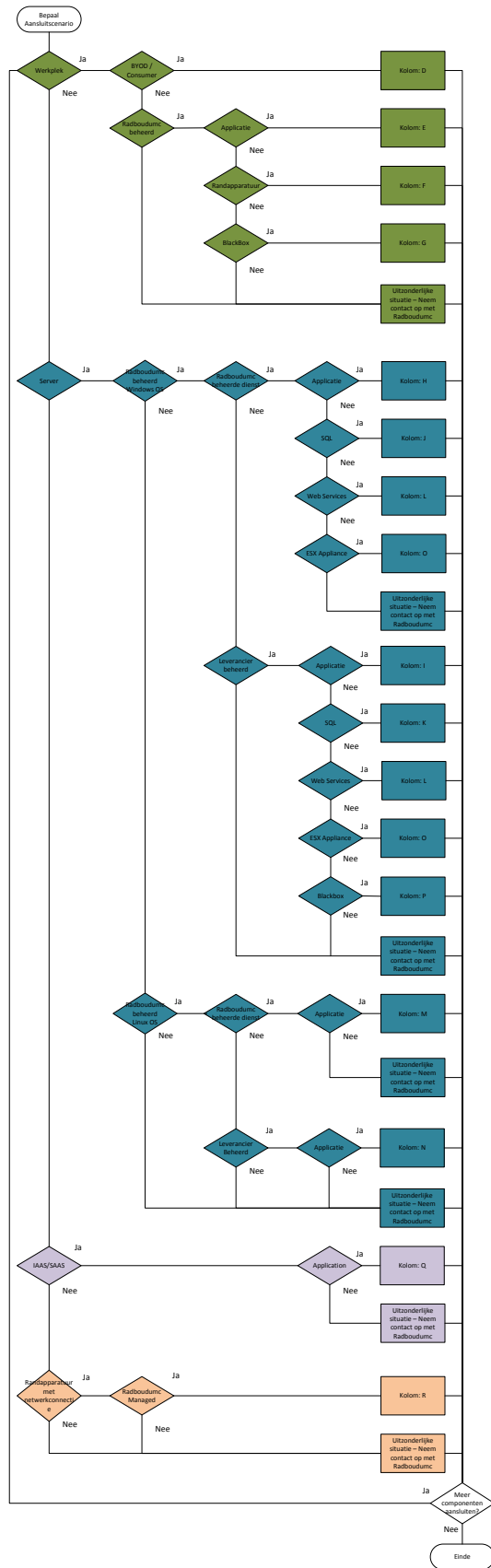
These are divided into categories. All framework requirements must be met within a category for a particular connection.

These categories are:

- Authentication and authorization
- Physical and network
- Integration services
- Applications
- Monitoring/logging/reporting/management
- Security
- Links

The connection requirements can be found in the attached Excel sheet.

5 Decision diagram



6 Contact details

If the information in this document has not sufficiently answered your questions, please contact the Department of Information Management of Radboud university medical center. The ICT Service Desk can probably answer most of your questions.

The decision diagram in Chapter 5 can lead you to the message "exceptional situation, contact Radboud university medical center". You can contact the ICT Service Desk via 024 361 50 71 or via servicedeskict@radboudumc.nl

If you have specific questions about the different infrastructure domains, you can also contact the technical experts of Information Management.

Domain	Technical Expert	E-mail address
Data and Telecommunications	Michael Arnoldussen	Michael.Arnoldussen@radboudumc.nl
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