Installing and configuring MS SQL Server

1. Preparing for Installing

MS SQL Server 2014 is the current version recommended by Microsoft, It has several editions and Contiki can work with all of them. Contiki can also use older versions (SQL Server 2008 and SQL server 2005) as well.

For information regarding SQL Server 2014 requirements refer to Microsoft information: https://msdn.microsoft.com/en-us/library/ms143506.aspx

The free version of SQL server, SQL Server 2014 Express edition, is good enough to run Contiki, the Demo and/or small models (SQL Server Express includes 10GB of storage per database). It can be downloaded from:

http://www.microsoft.com/en-us/server-cloud/products/sql-server-editions/sql-serverexpress.aspx

This document go's over the proper installing steps for SQL Server 2008 (R2), so it will function with Contiki.

Important: All critical/important updates must be performed and latest Service Packs must be installed for OS and MS SQL Server, any less than that can cause serious (security) problems.

2. Installing

Follow the next Screens:

1		SQL Server Installation Center –	×
Planning Installation	•	Hardware and Software Requirements View the hardware and software requirements.	^
Maintenance Tools	4	Security Documentation View the security documentation.	
Resources Advanced	•	Online Release Notes View the latest information about the release.	
Options		How to Get SQL Server Data Tools SQL Server Data Tools provides an integrated environment for database developers to carry out all their database design work for any SQL Server platform.	
	9	System Configuration Checker Launch a tool to check for conditions that prevent a successful SQL Server installation.	
	ľ	Install Upgrade Advisor Upgrade Advisor analyzes any SQL Server 2012, SQL Server 2008 R2, SQL Server 2008 or SQL Server 2005 components that are installed and identifies issues to fix either before or after you upgrade to SQL Server 2014.	
	1	Online Installation Help Launch the online installation documentation.	
	1	How to Get Started with SQL Server 2014 Failover Clustering Read instructions on how to get started with SQL Server 2014 failover clustering.	
Microsoft SQL Server 2014	•	How to Get Started with a PowerPivot for SharePoint Standalone Server Installation Read instructions on how to install PowerPivot for SharePoint in the fewest possible steps on a new SharePoint 2010 server.	v

Enter your product key

1	SQL Server 2014 Setup – 🗆 🗙
Product Key Specify the edition of SQL Serve	er 2014 to install.
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Feature Configuration Rules Ready to Install Installation Progress Complete	 Validate this instance of SQL Server 2014 by entering the 25-character key from the Microsoft certificate of authenticity or product packaging. You can also specify a free edition of SQL Server, such as Evaluation or Express. Evaluation has the largest set of SQL Server features, as documented in SQL Server Books Online, and is activated with a 180-day expiration. To upgrade from one edition to another, run the Edition Upgrade Wizard. Specify a free edition: Evaluation Evaluation The product key:
	< Back Next > Cancel

1	SQL Server 2014 Setup – 🗆 🗙
License Terms To install SQL Server 2014, you	u must accept the Microsoft Software License Terms.
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Feature Configuration Rules Ready to Install Installation Progress Complete	MICROSOFT SOFTWARE LICENSE TERMS MICROSOFT SQL SERVER 2014 STANDARD These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft • updates, • supplements,
	Copy Print I accept the license terms. Tum on Customer Experience Improvement Program ("CEIP") and Error Reporting to help improve the quality, reliability and performance of Microsoft SQL Server 2014. See the Microsoft SQL Server 2014 Privacy Statement for more information. * Microsoft SQL Server 2014 also includes a Visual Studio component that will have CEIP settings turned off by default. If Visual Studio is installed, this component will use the CEIP settings for Visual Studio.
	< Back Next > Cancel

1	SQL Server 2014 Setup – 🗆 🗙				
Install Rules Setup rules identify potential pr	oblems that might occur while running Setup. Failures must be corrected before Setup				
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules	Operation completed. Passed: 6. Failed 0. Warning 1. Skipped 0. Hide details << <u>View detailed report</u>	Re-run			
Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Feature Configuration Rules Ready to Install Installation Progress Complete	Rule Status Image: Status Fusion Active Template Library (ATL) Passed Image: Previous releases of SQL Server 2008 Business Intelligence Devel Passed Image: Consistency validation for SQL Server registry keys Passed Image: Computer domain controller Passed Image: Microsoft .NET Application Security Passed Image: Microsoft SQL Server 2014 CTP1 is present. Passed Image: Block install when Microsoft SQL Server 2014 CTP1 is present. Passed				
	< Back Next > Cancel	Help .::			

1	SQL Server 2014 Setup – 🗆 🗙					
Setup Role						
Click the SQL Server Feature Installation option to individually select which feature components to install, or click a feature role to install a specific configuration.						
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Feature Configuration Rules Ready to Install Installation Progress Complete	 SQL Server Feature Installation Install SQL Server Database Engine Services, Analysis Services, Reporting Services, Integration Services, and other features. All Features With Defaults Install all features using default values for the service accounts. 					
	< Back Next > Cancel Help					
1	SQL Server 2014 Setup – 🗆 🗙					
Feature Selection Select the Standard features to	install.					
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Feature Configuration Rules Ready to Install Installation Progress Complete	Eastures: Feature description: Instance Features: The configuration and operation of each instance feature of a SQL Server instance is isolated from other SQL Server instances. SQL Server instances: Image: Service Server instance is isolated from other SQL Server instance. SQL Server instances. SQL Server instances: Shared Features: Perequisites for selected features: Analysis Services Perequisites for selected features: Reporting Services - Native Perequisites for selected features: Already installed: Windows PowerShell 2.0 Management Tools Connectivity Microsoft Visual Studio 2010 Redistributables Microsoft Visual Studio 2010 Redistributables Microsoft Visual Studio 2010 Shell Management Tools - Complete Disk Space Requirements Distributed Replay Controller V Select All Unselect All Instance goot directory: C:\Program Files\Microsoft SQL Server\					
	Shared feature directory (<u>x</u> 86): C:\Program Files (x86)\Microsoft SQL Server\					

1		SQL Server 2014 Se	tup		- 🗆 🗙
Instance Configuration Specify the name and instance	ID for the instance of SQ	L Server, Instance ID be	comes part of the insta	llation path.	
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Feature Configuration Rules Ready to Install Installation Progress Complete	Default instance Default instance Named instance: Instance ID: SQL Server directory: Installed instances: Instance Name SQLYAH1 SQL2008 <shared <shared="" compone="" compone<="" th=""><th>SQL2014 SQL2014 C:\Program Files\Micro Instance ID MSSQL11.SQLYAH1 MSSQL10_50.SQL2008</th><th>soft SQL Server\MSSQL Features SQLEngine,SQLEngi SQLEngine SSMS, Adv_SSMS, C SSDTBI_VS2012 LocalDB</th><th>12.SQL2014 Edition Developer Standard</th><th>Version 11.0.2218.0 10.51.2500.0 11.0.2218.0 11.1.3369.0 11.0.2100.60</th></shared>	SQL2014 SQL2014 C:\Program Files\Micro Instance ID MSSQL11.SQLYAH1 MSSQL10_50.SQL2008	soft SQL Server\MSSQL Features SQLEngine,SQLEngi SQLEngine SSMS, Adv_SSMS, C SSDTBI_VS2012 LocalDB	12.SQL2014 Edition Developer Standard	Version 11.0.2218.0 10.51.2500.0 11.0.2218.0 11.1.3369.0 11.0.2100.60
			< <u>B</u> ack <u>N</u> ex	<t> Canc</t>	el Help
ti		SQL Server 2014	Setup		- 🗆 🗙
Server Configuration Specify the service accounts ar	nd collation configuration	ı.			

Product Key	Service Accounts Collation				
License Terms					
Global Rules	Microsoft recommends that you u	ise a separate account for each SQ	L Server service.		
Product Updates	Service	Account Name	Password	Startup Type	e
Install Setup Files	SQL Server Agent	NT Service\SQLAgent\$SQ		Manual	~
Install Rules	SQL Server Database Engine	NT Service\MSSQL\$SQL2		Automatic	~
Setup Role	SQL Server Browser	NT AUTHORITY\LOCALS		Automatic	~
Feature Selection					
Feature Rules					
Instance Configuration					
Server Configuration					
Database Engine Configuration					
Feature Configuration Rules					
Ready to Install					
Installation Progress					
Complete					
		C Pack Neut		col Lie	ala
		< <u>B</u> ack <u>N</u> ext	Can	He	ыb

18	SQL Server 2014 Setup	- 🗆 🗙
Server Configuration Specify the service accounts an	d collation configuration.	
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Feature Configuration Rules Ready to Install Installation Progress Complete	Service Accounts Collation Database Engine:	<u>C</u> ustomize
	< <u>B</u> ack <u>N</u> ext > Cancel	Help .:

1	SQL Server 2014 Setup – 🗆 🗙					
Database Engine Configuration Specify Database Engine authentication security mode, administrators and data directories.						
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Feature Configuration Rules Ready to Install Installation Progress Complete	Server Configuration Data Directories FILESTREAM Specify the authentication mode and administrators for the Database Engine. Authentication Mode Windows authentication mode Mixed Mode (SQL Server authentication and Windows authentication) Specify the password for the SQL Server system administrator (sa) account. Enter password: Enter password: Enter of the second server system administrator (sa) account. Specify SQL Server administrators SQL Server administrators YAH8/Laura (Laura) SQL Server administrators have unrestricted access to the Database Engine. Add Current User Add Remove					
	< <u>B</u> ack <u>N</u> ext > Cancel Help					

1	SQL Server 2014 Setup – 🗖	×
Ready to Install Verify the SQL Server 2014 fea	tures to be installed.	
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Feature Configuration Rules Ready to Install Installation Progress Complete	Ready to install SQL Server 2014: Summary Edition: Standard Action: Install (Product Update) Prerequisites Already installed: Windows PowerShell 2.0 Microsoft .NET Framework 3.5 Microsoft Visual Studio 2010 Redistributables Microsoft Visual Studio 2010 Redistributables Microsoft Visual Studio 2010 Shell Microsoft NET Framework 4.0 General Configuration Features Database Engine Services Management Tools - Basic Management Tools - Complete Instance Name: SQL2014 Instance ID: SQL2014 Instance ID: SQL2014 Instance Directory: C:\Program Files\Microsoft SQL Server\ Shared component root directory: Shared feature directory: C:\Program Files\Microsoft SQL Server\ Shared feature (WOW64) directory: C:\Program Files\Microsoft SQL Server\ Shared feature (WOW64) directory: C:\Program Files\Microsoft SQL Server\ Configuration file path: C:\Program Files\Microsoft SQL Server\120\Setup Bootstrap\Log\20150125_174109\ConfigurationFile.ini	~
	< <u>B</u> ack <u>I</u> nstall Cancel Help	

1	SQL Server 201	14 Setup	- 🗆 🗙
Complete Your SQL Server 2014 installati	on completed successfully with product upo	dates.	
Product Key License Terms Global Rules Product Updates Install Setup Files Install Rules Setup Role Feature Selection Feature Rules Instance Configuration Server Configuration Database Engine Configuration Feature Configuration Rules Ready to Install Installation Progress Complete	Information about the Setup operation o Feature Management Tools - Complete Management Tools - Basic Database Engine Services SQL Browser SQL Writer Setup Support Files Details: Viewing Product Documentation f Only the components that you use to been installed. By default, the Help V Server, you can use the Help Library computer. For more information, see (<http: ?link<br="" fwlink="" go.microsoft.com="">Microsoft Update For information about how to use Mic Summary log file has been saved to the for C\Program Files\Microsoft.SQL Server\1; Summary YAH8. 20150125 174109.txt</http:>	r possible next steps: Status Succeeded S	ation for SQL Server have library. After installing SQL documentation to your local SQL Server for SQL Server 2014, see the v 174109
			Close Help

3. Firewall settings for SQL Server remote access:

Open SQL Server to the firewall for remote access. For SQL Server 2014, the following ports must be included:

- TCP 1433
- TCP 1434
- UDP 1434

Refer to "How to: Configure a Windows Firewall for Database Engine Access" at the following link: <u>http://msdn.microsoft.com/en-us/library/ms175043.aspx</u>

4. Memory settings of the SQL Server:

Set the maximum server memory (in MB) to a value that is less than the memory installed on the PC. Use task manager to see the amount of available memory on your system when fully loaded. **There should always be at least 10 to 20 Percent (%) free physical memory available by average.** If there is not found to be enough memory available, then lower Maximum Server Memory assigned to SQL Server or add more memory to the system (see sample picture below). Memory use depends on the size of the data used and is at every customer different and ranges from a few MB's to many GB's. For **average users a setting from 128MB until 512MB should suffice**, Never have your PC use more than 90% averagely of its physical memory for this will cause the system to behave slow and less stable. Consult with experienced people for tuning your system if needed.

9	Microsoft SQL Server Management Studio (Administrator)	
File Edit View	Server Properties - YAH8\SQL2014 - 🗆 🗙	
Image: Security Image: Security Image: Security Image: Security	Script	- 11 2
Connection Server: YAH8\SQL2014 Connection: YAH8\Laura IP View connection properti Progress Ready	0 Image: Second state Minimum memory per query (in KB): 1024 Image: Second state I	
Ready	OK Cancel:	

5. Setting server proxy account:

When running Contiki Client on a different PC from the one where SQL Server is installed (using remote server) the SQL Server proxy must be granted with read rights on the Temp directory (refer to Installing Contiki document for further information)

Bulk insert uses sqlserv.exe and not Contiki5.exe. That is why it is needed to know how to grant 'sqlserv.exe' its proxy (read) rights on Temp directory.

How to find the SQL server proxy: The SQL proxy can be any installed user and is mostly not the same like the user you use to log in.

Notice: opening Management Studio or Contiki as an administrator does not change the SQL server proxy user. For bulk insert the proxy user used by the sqlserv.exe is the one needing read rights to the temporary data file location, that is often not the same like the user name you logged on to and you work with.

Use Task Manager (on the PC were the SQL server is installed) to verify who is running sqlserv.exe:

ı	Windows Task	Manager				
Eile	Options View	<u>H</u> elp				
1.	-t		1 nu		terrettere future a	
Ар	plications Proc	esses Services	s Peri	formance Net	tworking Users	
	Trucco d	Lines Name I	CDU	Manager	Description	
	Image 🔺	User Name	CPU	Memory (Description	
	smss.exe	SYSTEM	00	500 K	Windows Session Manager	
	SMSvcHost.exe	NETWO	00	4,632 K	SMSvcHost.exe	
	SMSvcHost.exe	LOCAL	00	6,980 K	SMSvcHost.exe	
	spoolsv.exe	SYSTEM	00	10, 176 K	Spooler SubSystem App	
	sqlbrowser.ex.	SQLproxy	00	3,784 K	SQL Browser Service EXE	
	sqlservr.exe	SQLproxy	00	51,272 K	SQL Server Windows NT - 64 Bit	
	sqlservr.exe	SQLproxy	00	309,340 K	SQL Server Windows NT - 64 Bit	
	sqlwriter.exe	SYSTEM	00	1,944 K	SQL Server VSS Writer - 64 Bit	
	Ssms.exe *32	Mikael	00	30,740 K	SSMS - SQL Server Management St	
	svchost.exe	LOCAL	00	11,496 K	Host Process for Windows Services	
	svchost.exe	SYSTEM	00	26,924 K	Host Process for Windows Services	
	svchost.exe	LOCAL	00	5,784 K	Host Process for Windows Services	
	svchost.exe	SYSTEM	00	4,632 K	Host Process for Windows Services	
	svchost.exe	NETWO	00	8,952 K	Host Process for Windows Services	
	svchost.exe	SYSTEM	00	4,292 K	Host Process for Windows Services	
	svchost.exe	NETWO	00	5.572 K	Host Process for Windows Services	-
Show processes from all users						
End Process			cess			
Processes: 71 CPU Usage: 1% Physical Memory: 51%						

Best practice: When installing the SQL Server it is best practice to create a limited user account and use this instead of the default options for the SQL Server user proxy. Changing it afterward has to be done with caution if there are other dependencies to the SQL Server.

For example, create a new user account "SQL Proxy" at your Domain/Workgroup with limited rights, and use this account for SQL Server proxy account. This will be the account that has to be granted with permissions to read from Temp directory.

Without a manual "Server proxy account" it is common for the "Server proxy account" to default to "local system" or similar accounts that have no default read permissions to shares and mappings even if targeted on that same PC.

In order to set the "Server proxy account": Open SQL Server Management Studio and login. Right click on the Server Name and select "Properties:

5	Microsoft SQL Server Management Studio (Administrator)
File Edit View Debug Tools Window	łelp
🕴 🛅 🕶 📨 📂 属 🥥 🔔 New Query 🏻 🔒	B B A B B 9 - C - 見 - B M P M
Object Explorer	
Connect 🕶 🛃 📑 🍸 🛃 🍒	
🖃 🐻 YAH8\SQL2014 (SQL Server 12.0.2000 -	
🖃 🚞 Databases	Connect
🕀 🚞 System Databases	Disconnect
🕀 🧰 Database Snapshots	Register
Security Server Objects	New Query
	Activity Monitor
🗉 📄 AlwaysOn High Availability	
🕀 🚞 Management	Start
Integration Services Catalogs	Stop
SQL Server Agent (Agent XPs disa	Pause
	Resume
	Restart
	Policies
	Facets
	Start PowerShell
	Reports
	Refresh
	Properties
< >	
Ready	

Choose "Security" and set the Server proxy account. Confirm by pressing OK.

8	Server Properties - YAH8\SQL2014 - 🗆 🗙
Select a page	Script 🔻 🚺 Help
Memory Processors Security Connections Database Settings Advanced Permissions	Server authentication Windows Authentication mode Image: SQL Server and Windows Authentication mode Login auditing None Eailed logins only Successful logins only Both failed and successful logins Server proxy account Image: Proxy account Proxy account: YAH8N aura
Connection	Password:
Server: YAH8\SQL2014	Options
Connection: YAH8\Laura	Enable C2 audit tracing <u>C</u> ross database ownership chaining
Progress	
Ready	
	OK Cancel

6. Setting SQL Server Logins:

SQL Server Login Minimum rights for Contiki Clients

Server roles: Bulkadmin

User Mapping: public & dbowner for Contiki's DB's.

To set Login properties, open Microsoft SQL Server Management Studio, open Security => Logins => right click on the desire login => Properties. On Server Roles check the required options. Minimum rights, as shown in the pictures bellow:

B	Login Properties - YAH8\Laura – 🗖 🗙
Select a page General	Script 👻 📑 Help
 Server Roles User Mapping Securables Status 	Server role is used to grant server-wide security privileges to a user.
	Server roles:
	diskadmin
	sysadmin
Connection	
Server: YAH8\SQL2014	
Connection: YAH8\Laura	
View connection properties	
Progress	
Ready	
	OK Cancel

On User Mapping, check Contiki's relevant database in the upper window.

After that, check the required rights in the lower window. Recommended rights for full DB control as shown in next picture:

8		Login Properties - Y	AH8\Laura	-	×	
Select a page	Script	🕶 📑 Help				
User Mapping	Users mappe <u>d</u> to this login:					
Image: Securables	Map	Database Contiki-EdemoSQL2005	User YAH8\Laura	Default Schema		
	·	Contiki-Hdemo-SQL2005	YAH8\Laura			
		model				
		tempdb				
Connection	Guest	account enabled for: Contiki- role membership for: Contiki-	Hdemo-SQL2005 Hdemo-SQL2005			
Connection	db_ac	cessadmin				
YAH8\SQL2014	✓ db_ba	ckupoperator tareader				
Connection:	✓ db_da	tawriter				
	✓ db_da	nydatareader nydatawriter /ner				
Progress	db_se	curityadmin				
Ready						
				ОК	Cancel	

Minimum rights requirement as shown below:

Connection	Database role membership for: Contiki-Hdemo-SQL2005
Server: YAH8\SQL2014 Connection: YAH8\Laura	db_accessadmin db_backupoperator db_datareader db_datawriter db_ddladmin db_denydatareader
Progress	db_denydatawriter ✔ db_owner db_securityadmin
Ready	public
	OK Cancel

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