## How to monitor RedHat Enterprise Linux 5 or 6 using Microsoft System Center Operations Manager (SCOM) 2012 SP1 - Part 2

## Installation of the SCOM agents on RHEL

In part 1 there is a description how to modify SCOM and RHEL to get ready for the agent installation. If this wasn't properly done you will get into trouble. Believe me! In this part 2 I will describe the agent installation and how to check if the setup was well done.

1. Open SCOM Operations Console, go to Administration pane, Device Management, right click on UNIX/Linux Computers, select Discovery Wizard

and a start comparest no in pro		operation in a manager					
File Edit View Go Tasks Too	vis Help						
Search * 11	(Scope)	Prind [ Tasks] 🔮 :					
Administration		UND(/Linux Computers (3)					
a 🎯 Administration		Q Look for		Find No	w Oear		
Connected Management Groups	ē.	Health State	Name	~ P	Address	SSH Port	Agent Version
Agent Managed	Device Management     Device Managed     Device Managed     Device Managed     Management Servers		Linux Server release 5.3 (Ti bvmcms21.bo-it.de bvmmdb21.bo-it.de	kanga) (2) 17, 17,	117.236.11 1.17.241.81	22 22	1.4.1-304 1.4.1-304
UNIX/Linux Computers		Platform: Red Hat Enterorise	Linux Server release 6.4 (Sa	(1) (ogsitne			
Management Packs	¥.	Discovery Wizard					
Discovery Rules     Network Devices     Network Devices	01 M M	Create Management Pack Download Management Packs Import <u>M</u> anagement Packs	imdb63.bo-it.de	17,	17.241.117	22	1.4.1-304

2. Select UNIX/Linux computers, click Next

Computer and Device Mana	ngement Wizard	×
Discovery Type		
Discovery Criteria	Choose the type of computers or devices to discover and manage.	
Computer Selection		
Computer Management	Windows computers Discover Windows computers in your Active Directory environment and install agents on the ones you want to manage.	
	UNIX/Linux computers     This enables you to discover UNIX and Linux computers in     your environment and install agents on the ones you want to     manage.	
	Network devices Discover and monitor network devices using Simple Network Management Protocol (SNMP).	
	Select a discovery type and click Next to continue.	
	< Previous Next > Discover Car	ncel

3. Click Add in the Define the criteria for discovering... window



4. Insert the FQDN or IP address of the Server which should be monitored:

scovery scope				
anges of IP add	ope is composed of one or more dresses, and a Secure Shell (S	e IP addresses, fully qualified SH) port.	I domain names (	FQDN) or
Disco	overy Scope		SSH Port	Add row
× 223		]	22	Damasa
				_h
scovery type				
scovery type łow do you wa	nt to discover the computers wi	thin the specified discovery s	scopes?	
scovery type łow do you wai All computers	nt to discover the computers wi	thin the specified discovery s	scopes?	
scovery type łow do you wai All computers	nt to discover the computers wi	thin the specified discovery :	scopes?	
scovery type fow do you war All computers edentials	nt to discover the computers wi	th <mark>i</mark> n the specified discovery s	scopes?	
scovery type low do you war All computers edentials Set the credenti	nt to discover the computers wi ials to be used to discover and i	thin the specified discovery s	scopes?	specified
scovery type low do you war All computers edentials Set the credenti liscovery scop	nt to discover the computers wi ials to be used to discover and i	thin the specified discovery s	scopes?	specified
scovery type fow do you war All computers edentials Set the credenti liscovery scop	nt to discover the computers wi ials to be used to discover and i	thin the specified discovery s	scopes?	specified Set credentials
scovery type fow do you war All computers edentials Set the credenti liscovery scop Action	nt to discover the computers wi ials to be used to discover and uses. Account	thin the specified discovery s run commands upon the com Account Type	scopes?	specified
scovery type fow do you war All computers edentials Set the credenti liscovery scop Action Discovery and	nt to discover the computers wi ials to be used to discover and i es. Account installation	thin the specified discovery s run commands upon the com Account Type	scopes?	specified
scovery type low do you wai All computers edentials Set the credenti liscovery scop Action Discovery and	nt to discover the computers wi ials to be used to discover and uses. Account installation	thin the specified discovery s run commands upon the com Account Type	scopes?	specified

Hint: Hit the return key to add the FQDN. Don't forget to click Set credentials!

5. Set the type of credentials in the following window as shown:

Credential Settings	
Default Credentials	Select the type of credential you want to use
<u>E</u> levation	<ul> <li>SSH key</li> <li>This will use an SSH key and can optionally include a passphrase. Using an SSH key will require additional credentials for the agent verification action.</li> <li>User name and password</li> <li>Communicating with remote computers using Secure Shell (SSH) carries security risks. This protocol sends passwords and other security information to the specified remote computers. Ensure that the remote computers are known and trusted.</li> </ul>
	Specify the account credentials that will be used. User name: opsmgrsvc Password:
	Confir <u>m</u> password: Does this account have privileged access?
	More about credentials for UNIX/Linux           OK         Cancel         Apply

Remember: In part 1 I have described the Linux setup of the user "**opsmgrsvc**"

6. Check the settings:

ecity the dis	covery criteria to dis-		INIX/Linux com	puters	
scovery sco	pe				
A discovery anges of IP	scope is composed o addresses, and a Se	of one or more IP addresses, fu cure Shell (SSH) port.	ully qualified do	main names (F	QDN) or
Di	scovery Scope			SSH Port	Add row
•			3	22	Domosio com
iscovery type How do you	e want to discover the (	computers within the specified	discovery sco	pes?	
iscovery type How do you All computer	e want to discover the ( s	computers within the specified	discovery sco	pes?	Ξ
iscovery type How do you All computer redentials	e want to discover the ( s	computers within the specified	discovery sco	pes?	Ξ
iscovery type How do you All computer redentials Set the crede discovery so	e want to discover the ( s entials to be used to o copes.	computers within the specified	discovery sco	pes?	specified Set credentials
Iscovery type How do you All computer redentials Set the cred discovery so Action	e want to discover the o s entials to be used to o copes. Account	computers within the specified discover and run commands u Account Type	discovery sco	pes?	specified Set credentials
Iscovery type How do you All computer redentials Set the cred discovery so Action Discovery	e want to discover the o s entials to be used to o copes. Account	computers within the specified discover and run commands u Account Type User name and pas	discovery sco	pes?	specified Set credentials
All computer redentials Set the crede discovery so Action Discovery Installation	e want to discover the o s entials to be used to o copes. Account opsmgrsvc None	computers within the specified discover and run commands u Account Type User name and pas Using sudo elevatio	discovery sco pon the comput sward	pes?	specified Set credentials

Don't forget to click Save!

7. Selection of the target resource pool:

liscovery Type		Mate	
scovery Criteria	Define the criteria for discovering	UNIX/Linux computers	
omputer Management	Click Add to define the discovery scop edit discovery criteria or to change cre	e and provide credentials to enable the dis identials, select an existing entry and click	covery process. To Edit.
	Discovery criteria:	🕹 <u>A</u> dd 🥡	Edit == Bernove
	Discovery Scope	Default Credential	SSH Port
			22
	Select target resource pool: Cross-Platform Monitoring Resource Poo	4	

Remember: In part 1 we have defined the resource pool. Click on Discover!

8. Selection of the computers to manage:



Select the appropriate checkbox and click on Manage!

9. Agent deployment starts:

Computer and Device Mana	agement Wizard nagement Progress			
Discovery Type Discovery Criteria Computer Selection Computer Management	Deployment and Management Please review the agent deployme successful, it might be necessary	t Complete ant results below. On computers where th to install the appropriate agent manually.	e deployme	int was not
	Deployment results: Computer Name Status Installing	Operating System	Version 6.4	Architecture x86_64
		111		,
		< Previous Next >	Done	Cancel

10. Agent deployment throws an error:

Computer M	anagement Progress					
scovery Type scovery Criteria mputer Selection mputer Management	Deployment and P Please review the as successful, it might	lanagement ent deploymen be necessary t	Complete It results belo o install the a	w. On computers where ppropriate agent manual	the deployme	ent was not
	Deployment results					
	Computer Name	Status	Details	Operating System	Version	Architecture
Computer: Message:	ad					
Certificate sig	ning operation was not successf	4				
Task invocat SCXCertWitk "Microsoft.U	ion failed with error code -21307. Action module encountered a D hix Agent GetCert, Task " has bee	71918. Error me oProcess excep n unloaded.	ssage was: T tion. The wor	he â		
25 GM 5254						

Oops! This wasn't expected. We have a look at the Linux server now. Do you remember that I told you to have a Linux admin by your side? Read the error message carefully and then click on Close!

11. If you try to login via ssh, sftp or scp to a Linux system all these accesses are logged to /var/log/secure. This text file is the first address to look for connection problems. So, let's have a look to this. I'm using the tail command for this purpose:

[root@ <hostname> ~]# tail -f /var/log/secure</hostname>	
Mar 27 15:09:55 <hostname> sshd[56686]: Accepted password for opsmgrsvc from <scom-ip> por</scom-ip></hostname>	t 57389 ssh2
Mar 27 15:09:55 <hostname> sshd[56686]: pam_unix(sshd:session): session opened for user op</hostname>	smgrsvc by (uid=0)
Mar 27 15:09:55 <hostname> sshd[56686]: pam_unix(sshd:session): session closed for user op</hostname>	osmgrsvc
Mar 27 15:09:56 <hostname> sshd[56704]: Accepted password for opsmgrsvc from <scom-ip> por</scom-ip></hostname>	t 57390 ssh2
Mar 27 15:09:56 <hostname> sshd[56704]: pam_unix(sshd:session): session opened for user op</hostname>	smgrsvc by (uid=0)
Mar 27 15:09:56 <hostname> sshd[56706]: subsystem request for sftp</hostname>	
Mar 27 15:09:56 <hostname> sshd[56704]: pam_unix(sshd:session): session closed for user op</hostname>	osmgrsvc

As we can see there are successful connections via ssh, protocol version 2 and a successful data transfer using sftp. Now we can state that our credentials are OK and valid!

## 12. Resignature of the Linux host certificate

After some googling around I found that the problem could be solved by resignature the certificate of the Linux host. In short words: we have to fetch the SCOM Agent certificate, copy it to the SCOM server, resignature it and copy it back to the Linux server. It's really a shame for Microsoft that they are not able to do this process during the agent rollout. As we can see above this is not a matter of rigts/security!

• We use for the following steps the sftp/scp/ftp client "FileZilla" you can get it from <a href="https://filezilla-project.org/">https://filezilla-project.org/</a> for free. The best way is to enable temporarily the root access for ssh to do the copy tasks. Again shame on Microsoft they haven't done their homework!

Z sttp://root@lFilei	FileZilla	
Eile Edit <u>V</u> iew Iransfer <u>S</u> e	Server Bookmarks Help	
Host: sftp://	Username: root Password: •••••• Port: Quickconnect	
Status: Directory listing Status: Directory listing Command: Cd "/etc/opt/mic Response: New directory is Command: Is Command: Listing directory Status: Directory listing	ting successful irrectory listing /microsoft/scx/ssl* ry is: "/etc/opt/microsoft/scx/ssl* tory /etc/opt/microsoft/scx/ssl ting successful	× _ >
Local site: 0: W	Remote site: /etc/opt/microsoft/scx/ssl	•
	<pre>ppt</pre>	× 🛄 >
r Filename	▲ Filesize Filetype Last modified	Permissions
8	E 1.704 PEM-Datei 27/03/2014 13:05:00	d-
-	scx-host- and per 13.05.00	jjj-
	Le cr.pem PEM-Datei 27/03/2014 13:05:00 drag 'n drop	Irvxrvxxvxx
•		*
1 file and 61 directories. Total size	size: 4/ Selected 1 file. Total size: 1.18 bytes	
Server/Local file	Direction Remote file Size Priority Status	
<pre>listp://root@image.com 0:\\\\\scc-host</pre>	• < /etc/opt/microsoft/scx/ssl/sc 1.188 Normal	

• Enter the connection credentials:

Host:	sftp://	<u>U</u> sername:	root	Pass <u>w</u> ord:		Port:	Quickconnect
-------	---------	-------------------	------	--------------------	--	-------	--------------

You have to enter the protocol, we use sftp. The hostname of the Linux server. Username and password. You can leave the port empty. Click on Quickconnect.

• Navigate to the directory of the agent certificate:



If you like you can go to this directory using a ssh connection:

[root@<hostname> ~]# cd /etc/opt/microsoft/scx/ssl

• Drag 'n drop the agent certificate to the Queued files pane:

Filename	Filesize	Filetype	Last modified ⊽	Permissions	
🥬 🗋 scx-key.pem 🦳	1.704	PEM-Datei	27/03/2014 13:05:00	-f	
scx-host-	1.188	PEM-Datei	27/03/2014 13:05:00		
🍌 scx.pem		PEM-Datei	27/03/2014 13:05:00	Irwxrwxrwx	

The agent certificate is named after the following scheme: scx-host-<hostname>.pem.

• Verify if the copy direction is from Linux to Windows system:



As you can see the file is copied from the Linux server to a MS Windows System on Drive O:\. The destination drive letter may vary in your environment.

• Initiate the copy process:

Server/Local file	Direction Remote fil	le
📱 sftp://root@🚛		
0: 🔌 💼 \so-h	ost-hym < /etc/ont/r Process Queue	microsoft/scx/ssl/sc
Queued files (1)	Stop and remove all Remove selected Default file exists action	

Now right click on the selected file and choose "Process Queue" to copy the file.

• Now we make a copy of the original certificate just for the case that something is going wrong:

[root@<hostname> ~]# cd /etc/opt/microsoft/scx/ssl
[root@<hostname> ~]# mv scx-host-<hostname>.pem scx-host-<hostname>.pem.orig

Organisieren 👻 📄 Öffn	en Brennen Neuer Ordner			
Netzwerk *	Name	Änderungsdatum	Тур	Größe
	🕿 Core Switch.jpg	05.03.2014 15:43	JPEG-Bild	326 1
s and a second	W Get-SSID.ps1	24.02.2014 10:13	Windows PowerS	1
Benutzer	ReportViewer.exe	22.08.2013 10:51	Anwendung	4.640
Ji inetpub	Sys_Ctr_Ops_Manager_Svr_2012_wSP1_En	26.06.2013 10:45	Datenträgerabbild	1.084.524
PertLogs	scx-host-	27.03.2014 13:15	PEM-Datei	2

• On the SCOM server side navigate to the copied certificate directory:

In this case we use the directory C:\Source. Maybe you have a different path.

• The resignaturing is done using Windows command line:

## cd "%ProgramFiles%\System Center 2012\Operations Manager\Server" scxcertconfig.exe -sign c:\Source\scx-host-<hostname>.pem c:\Source\scx-host-<hostname>-new.pem

- Now we've done the Windows part!
- Prepare to move the resignatured certificate:

🛃 sftp://root@bvmmdb06 - FileZilla					0	×
Eile Edit View Transfer Server	Bookmarks <u>H</u> elp					
	1 💺 🕸 🗐 🖓 🕈 🖪					
Host: sfp://	root Pass <u>w</u> ord: •••	Port:	Quick			
Command: Is Status: Listing directory /etc/r Status: Directory listing succe: Status: Retrieving directory lis Command: Is	pt/microsoft/scx/ssl sful ting					• [
Status: Listing directory /etc/r Status: Directory listing succei	pt/microsoft/scx/ssl sful					•
Local site: 0:	Remote site: /etc/opt/microsoft/scx/	2				•
Handler REZ	apt 					4
Enung - Projekte	conf sst					
Service *	2 scx.pe	E				F
Filename	Filename		Filesize	Filetype	Last modified $\  \  \  \  \  \  \  \  \  \  \  \  \ $	Permissio
🔒 scx-host- <b>ber</b> -new.pem	🚺 🗋 scx-key.pem		1.704	PEM-Datei	27/03/2014 13:05:00	
TOP5_REZ_20140211.docx	L scx-host-the scx-pem.orig		1.188	ORIG-Datei PEM-Datei	27/03/2014 13:05:00 27/03/2014 13:05:00	-rr
UataLore		E				
2 files and 61 directories. Total size: 45.8	2 files and 1 directory. Total size: 2.8	92 bytes				
Server/Local file Dire	ction Remote file	Size	Priority	Status		
	1000 0000 0000 0000 000					

Navigate in the left pane to the directory where the new certificate was generated.

• Queue the resignatured certificate:

Z sftp://root@bvmmdb06 - FileZilla			0	
Eile Edit View Iransfer Server Bo	okmarks <u>H</u> elp			
	★ ◆   目 以下 A			
Host: sftp://	oot Password:	Quickconnect		
Command: Is Status: Listing directory /etc/opt/in Status: Directory listing successful Status: Retrieving directory listing.	microsoft/scx/ssl I 			
Command: Is Status: Listing directory /etc/opt/n Status: Directory listing successful	microsoft/scx/ssl l			•
Local site: 0:	Remote site: //etc/opt/microsoft/scx/ssl			•
Elements - Events	ept			4
	SOX			
	55 CONI			]
<				Þ
Filename     ✓	Filename	Filesize Filetype	Last modified 7	Permissio
scx-host	scx-key.pem	1.704 PEM-Dat	ei 27/03/2014 13:05:00	j-
1 TOPs_REZ_20140211.docx	🗋 scx-host-	1.188 ORIG-Da	tei 27/03/2014 13:05:00	
Pool	📄 scx.pem	PEM-Dat	ei 27/03/2014 13:05:00	Invxnvxnv
DPA				
📕 Scan_Ablage				
🕌 Samba				
Surtem Center	E			-
Selected 1 file. Total size: 1.224 bytes 2	2 files and 1 directory. Total size: 2.892 bytes		¢.	
Server/Local file Direction	n Remote file		Size Priority Status	
Jettp://root@				
ON scx-host-bym>	/etc/opt/microsoft/scv/ssl/scx-host-	pem	1.224 Normal	
	144			•

Drag 'n drop the new certificate from the left pane to the bottom pane. Make sure that the destination directory on the rigth pane is available!

• Transfering the resignatured certificate to the Linux server:

🛃 sftp://root@bvmmdb06 - FileZilla			0	
File Edit View Transfer Server	Bookmarks Help			
	3 📽 🕸 🗐 🖉 🖓 🖓 🗷			
Host: sftp://	: root Password: •••••• Port:	Quickconnect		
Status: Listing directory /etc/o Status: Directory listing succes Status: Retrieving directory list Command: Is	pt/microsoft/scx/ssl ssful ting			4
Status: Listing directory /etc/or Status: Directory listing succes Status: Connecting to Status	pt/microsoft/scx/ssl sful 			•
Local site: 0:	Remote site: //etc/opt/microsoft/scx/ssl			
E	a			•
Eitung	SCX SCX			
e				j
Service *				۲
← Filename	Filename	esize Filetype	Last modified $ abla $	Permissio
		TAN DEM PAL	00.30.CT 1 10C/ CU/ FC	
W TOPs REZ 20140211.docx	scr-host-	L.188 ORIG-Datei	27/03/2014 13:05:00	
Pool	ec.pem	PEM-Datei	27/03/2014 13:05:00	Irwxrwxrw
DPA				
📕 Scan_Ablage				
DataCore				
<pre>4 III }</pre>				
Selected 1 file. Total size: 1.224 bytes	2 files and 1 directory. Total size: 2.892 bytes		6	
Server/Local file Direc	ction Remote file	Size	Priority Status	
📱 sftp://root@i				
0://www.sex-host-bvm	> /etc/opt/microsoft/scv/ssl/scx-hostnew.pem	1.224	Normal Connectin	Ē.
Connecting a sttp://root@	1			
11-	10 10			-

Start the transfer by right-click on the file in the bottom pane and select "Process Queue".

Successful transfer:

Z sftp://root@bvmmdb06 - FileZilla				D	
Eile Edit View Transfer Server	Bookmarks Help				
	1 * & II   * * 1				
Host: sftp://	e: root Password: •••••••	Port: Quick	connect 🖌		
Command: put "O: status: Status: local:O: status: Status: File transfer successfi Status: Retrieving directory lis Command: lo	+host	em" t/scx/ssl/scx-host	mew.pem		•
Status: Listing directory /etc/c Status: Directory listing succe	lopt/microsoft/scx/ssl essful				•
Local site: 0:	Remote site: /etc/opt/microsoft/scx/ssl				•
. REZ	Det     Det     Det     Det     Det     Det				•
Ettung	scx				
Projekte					
Service	T Scxpem				Þ
r Filename	Filename	Filesize	Filetype	Last modified $ abla $	Permissio
scx-host	Scx-host-	1.224	PEM-Datei	27/03/2014 13:53:00	JJ-MJ-
TOPs_REZ_20140211.docx	scx-key.pem	1.704	PEM-Datei	27/03/2014 13:05:00	
Pool	scx-host-	1.188	ORIG-Datei	27/03/2014 13:05:00	
DPA	tex.pem		PEM-Dater	2//03/2014 13:02:00	WXWXW
Scan_Ablage					
DataCore					
Curtan Cantar     A III     A					*
Selected 1 file. Total size: 1.224 bytes	3 files and 1 directory. Total size: 4.116 bytes			5	
Server/Local file Dire	ection Remote file		Siz	e Priority Status	
	18 1				•

If the transfer was successful you will find the backup of the original certificate and the new resignatured certificate in the same directory.

• Now we switch back to the Linux command line:



It's now the time to do little file operations: rename the new certificate and assign the correct file permissions.

13. No we have to go back to the Select UNIX/Linux computers screen, click Next

🚊 Computer and Device Manag	ement Wizard	×
What would yo	u like to manage?	
Discovery Type		
Discovery Criteria	Choose the type of computers or devices to discover and manage.	
Computer Selection		
Computer Management	Windows computers Discover Windows computers in your Active Directory environment and install agents on the ones you want to manage	
	UNIX/Linux computers     This enables you to discover UNIX and Linux computers in     your environment and install agents on the ones you want to     manage.	
	Network devices Discover and monitor network devices using Simple Network Management Protocol (SNMP).	
	Select a discovery type and click Next to continue.	
	< Previous Next > Discover	Cancel

14. Check the settings:

A discover	y scope is composed of Paddresses and a Sec	f one or more IP addresses	fully qualified do	main names (F	QDN) or
angeo or	1 400100000, 4110 0 000	cure Shell (SSH) port.		anan names (i	
	Discovery Scope			SSH Port	Add row
•			8	22	0
iscovery ty How do yo All comput	npe u want to discover the c ers	computers within the specifi	ed discovery sco	pes? ▼	
iscovery ty How do yo All comput redentials Set the cre discovery	pe u want to discover the c ers identials to be used to di scopes.	computers within the specific	ed discovery sco upon the comput	ers within the s	specified
iscovery ty How do yo All comput redentials Set the cre discovery Action	pe u want to discover the c ers dentials to be used to di scopes. Account	computers within the specific	ed discovery sco	ers within the s	specified Set credentials
iscovery ty How do yo All comput redentials Set the cre discovery Action	pe u want to discover the c ers dentials to be used to di scopes. Account opsmgrsvc	computers within the specifi iscover and run commands Account Type User name and p	ed discovery sco upon the comput	opes?	specified Set credentials

15. Again selection of the computers to manage:

Select the Please wai depending Discovery Manageat	e computers you t while the UND/Li on the size of your results: sle computers (1 res	want to man nux computers network.	age in your netwo results (Q resu	ork are discovered. This may take so	ome time
Select the Please wai depending Discovery Manageat	e computers you t while the UNIXL on the size of your results: sle computers (1 res	want to man nux computers network. uit) Additional	age in your netwo results (Q resu	ork are discovered. This may take so	ome time
Select the Please wai depending Discovery Manageat	e computers you t while the UNDVLi on the size of your results: ple computers (1 res	want to man nux computers network.	age in your netwo results (Q resu	ork are discovered. This may take so	ome time
Discovery Manageat	t while the UNDVLi on the size of your results: le computers (1 res	nux computers network.	in your netwo results (D resu	ork are discovered. This may take so	ome time
Please wai depending Discovery Manageat	t while the UNDVLi on the size of your results: sle computers (1 res	nux computers network. uit) Additional	in your netwo results (D resu	ork are discovered. This may take so	ome time
Manageab	vesuris: ple computers (1 res	uit) Additional	results (O resu	.lts)	
V 0					
1	omputer Name	IP Address	Action	Operating System	1
			Manage	Detals Red Hat Enterprise Linux S	Server 6
		ŦŦ			,
				Manage     Manage     Manage     Manage     Manage     Manage     Manage	Manage Details Red Hat Enterprise Linux S

Select the appropriate checkbox and click on Manage! Note: There is just the action manage available.

16. Agent deployment now successful:



Click on Done! We've got it.

You can download this page as pdf file [922 kB].

On the <u>next page</u> I will provide some additional information about the SCOM agent.

On the previous page I described the base setup of the SCOM and RHEL.

 $\bowtie$ 

Frank Ickstadt Am Königsbachtal 32.1 65817 Eppstein Germany



frank [dot] ickstadt [at] removethis gmail [dot] com

Fax: currently out of order

Your browser: Netscape ; 5.0 (Windows)

