# Pristup

- Pristup klasteru iz mreže CARNET
  - <sup>o</sup> Linux
  - MS Windows
  - <sup>o</sup> Korištenje grafičkog okruženja
    - Linux
    - MS Windows
- Pristup klasteru izvan mreže CARNET
  - O Izrada ključeva
    - Linux
    - MS Windows
  - <sup>o</sup> Spajanje na posebni pristupni čvor
    - Linux
    - MS Windows
  - O Spajanje na klaster
  - <sup>O</sup> Korištenje grafičkog okruženja
    - Linux
    - MS Windows
  - <sup>o</sup> Kopiranje datoteka s osobnog računala na klaster
    - Linux
    - MS Windows

Nakon uspješne prijave dobiti ćete e-mail s pristupnim podacima za klaster.

Adresa pristupnog čvora klastera je teran.srce.hr, a pristupa se protokolom SSH.

Direktan pristup klasteru moguć je isključivo iz CARNET-ove mreže.

## Pristup klasteru iz mreže CARNET

#### Linux

Ako koristite neki od Linux OS-ova, klasteru možete pristupiti iz komandne linije koristeći naredbu (korisničko ime u primjeru je korisnik):

ssh korisnik@teran.srce.hr

Nakon izvršavanja gornje naredbe, potrebno je upisati dobivenu zaporku.

## **MS Windows**

Ako koristite Windows OS, za pristup klasteru potrebno je instalirati SSH klijent (npr. Putty).

Nakon instalacije i pokretanja, na početnom ekranu programa Putty, u polje Host Name (or IP address) potrebno je upisati

korisnik@teran.srce.hr

te zatim kliknuti na gumb Open. Nakon toga, u otvoreni prozor potrebno je upisati dobivenu zaporku.

🕵 PuTTY Configuration	? ×
Category:	
<ul> <li>Session         <ul> <li>Logging</li> <li>Terminal</li> <li>Keyboard</li> <li>Bell</li> <li>Features</li> </ul> </li> <li>Window         <ul> <li>Appearance</li> <li>Behaviour</li> <li>Translation</li> <li>Selection</li> <li>Colours</li> </ul> </li> <li>Connection         <ul> <li>Proxy</li> <li>Telnet</li> <li>Rlogin</li> <li>SSH</li> <li>Serial</li> </ul> </li> </ul>	Basic options for your PuTTY session         Specify the destination you want to connect to         Host Name (or IP address)       Port         korisnik@teran.srce.hr       22         Connection type:       Raw         Raw       Telnet       Rlogin         Load, save or delete a stored session       Saved         Saved Sessions       Load         Save       Delete         Close window on exit:       Image: Only on clean exit
About Help	Open Cancel

## Korištenje grafičkog okruženja

#### Linux

Spojite se na teran.srce.hr prosljeđujući X11:



Po spajanju, možemo testirati uspješnost provedene akcija pomoću naredbe

xterm

#### **MS Windows**

Preuzmite i pokrenite aplikaciju Xming.



Za grafičko okruženje potrebno je u kategoriji Connection-SSH-X11 odabrati Enable X11 forwarding.

🕵 PuTTY Configuratio	on		?	$\times$
Category:				
- Bell - Features Window - Appearance - Behaviour Translation		Options controlling SSH X11 forward X11 forwarding <u>Enable X11 forwarding</u> <u>X display location</u>	arding	
<ul> <li>Iranslation</li> <li>Selection</li> <li>Colours</li> <li>Connection</li> <li>Data</li> <li>Proxy</li> <li>Telnet</li> <li>Rlogin</li> <li>SSH</li> <li>Kex</li> <li>Host keys</li> <li>Cipher</li> <li>Auth</li> <li>TTY</li> <li>X11</li> <li>Tunnels</li> <li>Bugs</li> <li>More bugs</li> <li>Serial</li> </ul>		Remote X11 authentication protocol <ul> <li>MIT-Magic-Cookie-1</li> <li>XDM-Auth</li> </ul> X authority file for local display	Bro <u>w</u> se.	
About	<u>H</u> elp	<u>O</u> pen	<u>C</u> ancel	

## Pristup klasteru izvan mreže CARNET

Preporučeni način pristupanja klasteru izvan mreže CARNET je korištenjem usluge VPN vaše matične ustanove.

Ako to nije moguće, od sada možete pristupati putem posebnog pristupnog čvora kojemu se pristupa protokolom SSH isključivo uz korištenje ključeva dok pristup pomoću lozinke nije moguć.

Ukoliko imate potrebu za pristupanjem klasteru izvan mreže CARNET morate izraditi SSH ključeve i poslati nam zahtjev s **javnim ključem** na isabella@srce. hr. Zahtjev mora biti poslan s email-a koji ste koristili u prijavi.

## Izrada ključeva



#### Linux

Izradite SSH ključeve iz komandne linije pomoću naredbe:

ssh-keygen

U zahtjevu priložite datoteku ~/.ssh/id\_rsa.pub.

### **MS Windows**

Instalirajte aplikaciju PuTTYgen. Po pokretanju aplikacije pritisnite gumb Generate, upišite Key passphrase te spremite javni i privatni ključ. U zahtjevu pošaljite tekst u polju **Public key for pasting into OpenSSH authorized\_keys file**.

💅 PuTTY Key Generato	or		? ×
File Key Conversions	Help		
Key			
Public key for pasting ir	nto OpenSSH authorize	d_keys file:	
ssh-rsa AAAAB3NzaC1yc2EA sjh +zE5EJz5jhSJCf/hzNS xnwPlyR9rkpTr1nqtkoł	AAABJQAAAQEAvltzF SKM6R5XAgKndgIC8B 16QyxEZ3dddG1yd64g	iSGBGxspQKlpWFWg1i KIsH1up0xcw/X0+yWOl9 e4gSCH6Y8QW/3KdaZu	8w/nrZWzIAmn5B 9/QbYO6wIOK5/rH uWRxq7ovT4RXv
Key fingerprint:	ssh-rsa 2048 16:2b:c9	:fe:25:a9:c5:81:02:0d:23	:e6:a4:ae:e9:44
Key comment:	rsa-key-20200320		
Key passphrase:	•••••		
Confirm passphrase:	•••••		
Actions			
Generate a public/priva	ite key pair		Generate
Load an existing private	e key file		Load
Save the generated ke	у	Save public key	Save private key
Parameters			
Type of key to generate	e: DSA OECDS	SA 🔿 Ed25519	SSH-1 (RSA)
Number of bits in a gen	ierated key:		2048

## Spajanje na posebni pristupni čvor

Adresa posebnog poslužitelja za spajanje izvan CARNET mreže je keybella.srce.hr, a pristupa se protokolom SSH.

#### Linux

Preduvjet za spajanje je da je na računalu instaliran privatni ključ koji ste generirali u prethodnom koraku. Spajanje se obavlja korištenjem naredbe (korisničko ime u primjeru je *korisnik*):

ssh korisnik@keybella.srce.hr

Ukoliko dobijete grešku oblika:

keybella.srce.hr: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).

potrebno je eksplicitno navesti lokaciju ssh ključa naredbom:

ssh -i ~/.ssh/id\_rsa korisnik@keybella.srce.hr

### **MS Windows**

Za spajanje se koristi alat Putty uz upisivanje putanje privatnog ključa.



## Spajanje na klaster

Nakon spajanja na posebni pristupni čvor klasteru možete pristupiti koristeći naredbu:

Nakon izvršavanja gornje naredbe, potrebno je upisati zaporku koju koristite za spajanje na teran.srce.hr.

### Korištenje grafičkog okruženja

Za korištenje grafičkog okruženja potrebno je prvo uspostaviti SSH tunel između osobnog računala i posebnog računala **keybella.srce.hr**. Po uspostavi tunela moguća je izravna SSH komunikacija s pristupnim čvorom teran.srce.hr korištenjem lokalne adrese **localhost** i odabranog porta (u primjerima se koristi 2222).



#### Linux

Uspostavite SSH tunel između osobnog računala i posebnog računala keybella.srce.hr:

```
ssh -NL 2222:teran.srce.hr:22 korisnik@keybella.srce.hr
```

Ukoliko ste uspješno uspostavili konekciju u drugom terminalu na osobnom računalu izvesti naredbu:

```
ssh -X -p 2222 korisnik@localhost
```

#### Unesite lozinku za teran.srce.hr.

Po spajanju, možemo testirati uspješnost provedenih akcija pomoću naredbe

xterm

#### **MS Windows**

Uspostavite SSH tunel između osobnog računala i posebnog računala keybella.srce.hr:

Unesite:

- Hostname: keybella.srce.hr
- Port: 22
- Auto-login username: korisnik
- Private key file for authentication: put do privatnog ključa
- Source port: 2222
- Destination: teran.srce.hr:22

😹 PuTTY Config	guration					?	×
Category:							
Session			Basic o	ptions	s for your PuTTY	session	
		Specify	the destination	ation	you want to con	nect to	
Keyboard		Host N	lame (or IP	addr	ess)	Port	
Bell		keybe	lla.srce.hr			22	
Features		Conne	ction type:				
Appearance		ORa	<u>w</u> Ole	elnet		<u>s</u> sh ()	Se <u>r</u> ial
Behaviour		-Load, s	ave or dele	te a s	tored session		
<ul> <li>Translation</li> <li>Selection</li> </ul>		Saved	Sessions				
Colours		keybe	lla				
		Defau	It Settinas				bod
Proxy							Jau
Telnet						Sa	a <u>v</u> e
Rlogin						De	lete
Serial						~	
						]	
		Close	window on	e <u>x</u> it:			
			vays 🔘	Neve	er 💿 Only o	n clean exit	t
					0		
About	Help				<u>O</u> pen	<u>C</u> a	ncel
😵 PuTTY Confid	uration					?	X
Catagone	, 						
				ata ta	cond to the cor	vor	
Logging		المعنام	eteile.		Senti to the Ser	vei	
Terminal		-Login a	etalls		le e el		
- Keyboard		A <u>u</u> to-le	ogin userna	ame	korisnik		
Features		When	username	is not	specified:		
Window		• Pro	ompt 🔿	Use	system usernam	ne (Adminis	strator)
Behaviour		Termina	al details —				
Translation		<u>T</u> ermir	nal-type stri	ng	xterm		
Selection		Termir	al speeds		38400.38	400	
		10111	a <u>o</u> poodo				
Data		Environ	ment varia	bles			
Proxy		<u>V</u> ariab	le				A <u>d</u> d
Rlogin		Value					
B SSH						R	emove
Serial							

😹 PuTTY Configurat	tion		?	$\times$
Category:				
Keyboard	^	Options controlling SSH authentic	ation	
- Features		Display pre-authentication banner (SSF	1-2 only) only)	
- Appearance Behaviour		Authentication methods		
Translation		Attempt authentication using Pageant		
Selection		Attempt TIS or CryptoCard auth (SSH-1	1)	
		Attempt "keyboard interactive" auth (SSI	기 SH-2)	
Data			511-27	
Proxy		Authentication parameters		
Telnet		Allow agent <u>f</u> orwarding		
Riogin		Allow attempted changes of username	in SSH-2	
Kex		Private <u>k</u> ey file for authentication:		_
- Host keys		D:\put\do\kljuca.ppk	Bro <u>w</u> se	
Cipher				
-X11				
Tunnels				
-Bugs				
Serial	$\sim$			
About	<u>H</u> elp	<u>O</u> pen	<u>C</u> ancel	
PuTTY Configurat	tion		?	×
PuTTY Configurat Category: Keyboard Rot	tion	Options controlling SSH port forwa	? arding	×
PuTTY Configurat Category: Keyboard Bell Features	tion	Options controlling SSH port forwar	? arding	×
PuTTY Configurat Category: - Keyboard - Bell - Features Window	tion	Options controlling SSH port forwar Port forwarding Local ports accept connections from oth	? arding her hosts	×
PuTTY Configurat Category:  Keyboard Bell Features Window Appearance	tion	Options controlling SSH port forwar Port forwarding Local por <u>t</u> s accept connections from oth Remote <u>ports</u> do the same (SSH-2 only	? arding her hosts /)	×
PuTTY Configurat Category: Category	tion	Options controlling SSH port forwar Port forwarding Local ports accept connections from oth Remote ports do the same (SSH-2 only Forwarded ports:	? arding her hosts /) Remove	×
PuTTY Configurat Category:  Keyboard Bell Features Window Appearance Behaviour Translation Selection	tion	Options controlling SSH port forwar Port forwarding Local ports accept connections from ott Remote ports do the same (SSH-2 only Forwarded ports:	? arding her hosts /) <u>R</u> emove	×
<ul> <li>PuTTY Configurat</li> <li>Category:</li> <li>Keyboard</li> <li>Bell</li> <li>Features</li> <li>Window</li> <li>Appearance</li> <li>Behaviour</li> <li>Translation</li> <li>Selection</li> <li>Colours</li> </ul>	tion	Options controlling SSH port forwar Port forwarding Local ports accept connections from oth Remote ports do the same (SSH-2 only Forwarded ports: L2222 teran.srce.hr:22	? arding her hosts /) <u>R</u> emove	×
PuTTY Configurat Category: - Keyboard - Bell - Features Window - Appearance - Behaviour - Translation Behaviour - Translation Belection - Colours Connection	tion	Options controlling SSH port forwar Port forwarding Local ports accept connections from ott Remote ports do the same (SSH-2 only Forwarded ports: L2222 teran.srce.hr:22	? arding her hosts /) <u>R</u> emove	
PuTTY Configurat Category: Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy	tion	Options controlling SSH port forwar Port forwarding Local ports accept connections from oth Remote ports do the same (SSH-2 only Forwarded ports: L2222 teran.srce.hr:22 Add new forwarded port:	? arding her hosts /) <u>Remove</u>	×
PuTTY Configurat Category: - Keyboard - Bell - Features Window - Appearance - Behaviour - Translation - Selection - Colours - Connection - Data - Proxy - Telnet	ion 🔨	Options controlling SSH port forwar         Port forwarding         Local ports accept connections from ott         Remote ports do the same (SSH-2 only Forwarded ports:         L2222       teran.srce.hr:22         Add new forwarded port:         Source port	? arding her hosts /) Remove	
PuTTY Configurat Category: - Keyboard - Bell - Features Window - Appearance - Behaviour - Translation - Selection - Colours - Connection - Data - Proxy - Telnet - Rlogin - Colu	tion 🔨	Options controlling SSH port forwar         Port forwarding         Local ports accept connections from ott         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port	? arding her hosts /) <u>R</u> emove	
PuTTY Configurat Category: - Keyboard - Bell - Features Window - Appearance - Behaviour - Translation - Selection - Colours - Connection - Data - Proxy - Telnet - Rlogin - SSH - Kex	tion 🔨	Options controlling SSH port forwar         Port forwarding         Local ports accept connections from oth         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port         Destination	? arding her hosts /) Remove	
PuTTY Configurat Category: Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Kex Host keys	tion	Options controlling SSH port forwarding         Port forwarding         Local ports accept connections from oth         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran srce.hr:22         Add new forwarded port:         Source port         Destination <ul> <li>Local</li> <li>Remote</li> <li>Remote</li> <li>Remote</li> <li>Remote</li> </ul>	? arding her hosts ) Remove Add	
PuTTY Configurat Category: Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Kex Host keys Cipher	tion •	Options controlling SSH port forwarding         Port forwarding         Local ports accept connections from oth         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port         Destination            ● Local       Remote         ● Auto       IPv4	? arding her hosts ) Remove Add Dynamic Pv6	
PuTTY Configurat Category: Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Kex Host keys Cipher Auth TTY	tion •	Options controlling SSH port forwarding         Port forwarding         Local ports accept connections from ott         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port         Destination         ● Local       Remote         ● Auto       IPv4	? arding her hosts () <u>Remove</u> <u>Add</u> Dynamic Pv <u>6</u>	
PuTTY Configurat Category: Category: Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Kex Host keys Cipher Auth TTY X11	tion •	Options controlling SSH port forwarding         □ Local ports accept connections from ott         □ Remote ports do the same (SSH-2 only         Forwarded ports:         □ L2222         teran.srce.hr:22         Add new forwarded port:         Source port         □ Destination         ● Local       Remote         ● Local       IPv4	? arding her hosts )) <u>Remove</u> A <u>d</u> d Dynamic Pv <u>6</u>	
PuTTY Configurat Category: - Keyboard - Bell - Features Window - Appearance - Behaviour - Translation - Selection - Colours - Connection - Data - Proxy - Telnet - Rlogin - SSH - Kex - Host keys - Cipher - Auth - TTY - X11 - Tunnels	tion •	Options controlling SSH port forward         Port forwarding         Local ports accept connections from ott         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port         Destination <ul> <li>Local</li> <li>Remote</li> <li>Destination</li> <li>Auto</li> <li>IPv4</li> </ul>	? arding her hosts ) Remove Add  Dynamic Pv6	
PuTTY Configurat Category: Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Kex Host keys Cipher Auth TTY X11 Tunnels Bugs	tion •	Options controlling SSH port forwar         Port forwarding         Local ports accept connections from oth         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port         Destination <ul> <li>Local</li> <li>Remote</li> <li>IPv4</li> <li>II</li> </ul>	? arding her hosts /) Remove Add Dynamic Pv <u>6</u>	
PuTTY Configurat Category: Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Kex Host keys Cipher Auth TTY X11 Tunnels Bugs More bugs	tion •	Options controlling SSH port forwarding         Port forwarding         Local ports accept connections from ott         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port         Destination <ul> <li>Local</li> <li>Remote</li> <li>Remote</li> <li>Interview</li> </ul>	? arding her hosts ) <u>Remove</u> Add Dynamic Pv <u>6</u>	
PuTTY Configurat Category: Keyboard Bell Features Window Appearance Behaviour Translation Selection Colours Connection Data Proxy Telnet Rlogin SSH Kex Host keys Cipher Auth TTY X11 Tunnels Bugs More bugs Serial	tion	Options controlling SSH port forwar         Port forwarding         Local ports accept connections from ott         Remote ports do the same (SSH-2 only         Forwarded ports:         L2222         teran.srce.hr:22         Add new forwarded port:         Source port         Destination            ● Local       Remote         Auto       IPv4	? arding her hosts ) Remove Add  Dynamic Pv6	

Nakon postavljanja odaberite Open.

Preuzmite i pokrenite aplikaciju Xming.



Otvorite još jedan PuTTY prozor (ne zatvarajte prošli prozor). Upišite

- Host Name: 127.0.0.1
- Port: 2222
- Auto-login username: korisnik
- kategoriji Connection→SSH→X11 odaberite Enable X11 forwarding.



Nakon postavljanja odaberite Open. Unesite korisničko ime i lozinku za teran.srce.hr.

Po spajanju, možemo testirati uspješnost provedenih akcija pomoću naredbe

xterm

## Kopiranje datoteka s osobnog računala na klaster

Za izravno kopiranje datoteka na pristupno računalo teran.srce.hr potrebno je uspostaviti SSH tunel opisan u prethodnom poglavlju.

#### Linux

Uspostavite SSH tunel između osobnog računala i posebnog računala keybella.srce.hr:

```
ssh -NL 2222:teran.srce.hr:22 korisnik@keybella.srce.hr
```

Ukoliko ste uspješno uspostavili konekciju u drugom terminalu na osobnom računalu izvesti naredbu:

```
scp -P 2222 ime_datoteke_koju_kopiramo korisnik@localhost:
```

Unesite lozinku za teran.srce.hr.

#### **MS Windows**

Potrebno je kreirati SSH tunel pomoću aplikacije PuTTY (prethodno poglavlje). Nakon kreiranja tunela, otvorite program WinSCP i unesite:

- Host name: 127.0.0.1
- Port: 2222
- User name: korisnik
- Password: lozinka za teran.srce.hr

🌯 Login		- 🗆 X
Login New Site	Session File protocol: SFTP V Host name: 127.0.0.1 User name: korisnik Save V	Port number: 2222 • Password: Advanced •
<u>I</u> ools ▼ <u>M</u> anage ▼	🔁 Login 🔻	Close Help