

The Modular Java Platform & Project Jigsaw

Mark Reinhold (@mreinhold)
*Chief Architect, Java Platform Group
Oracle*

2014/2/4



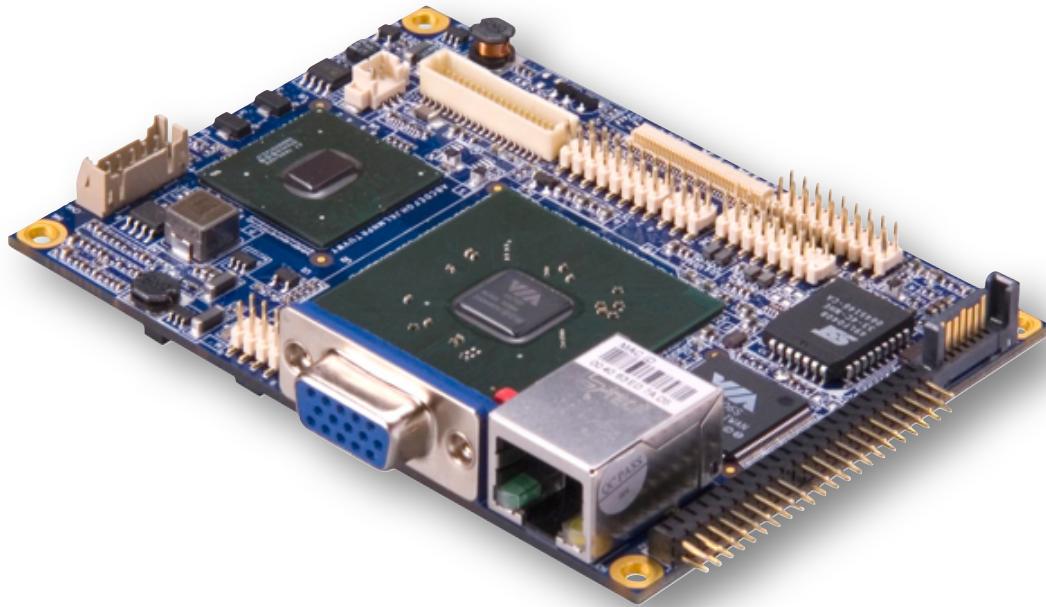
MAKE THE
FUTURE
JAVA

ORACLE®

Scalability

Performance

Security

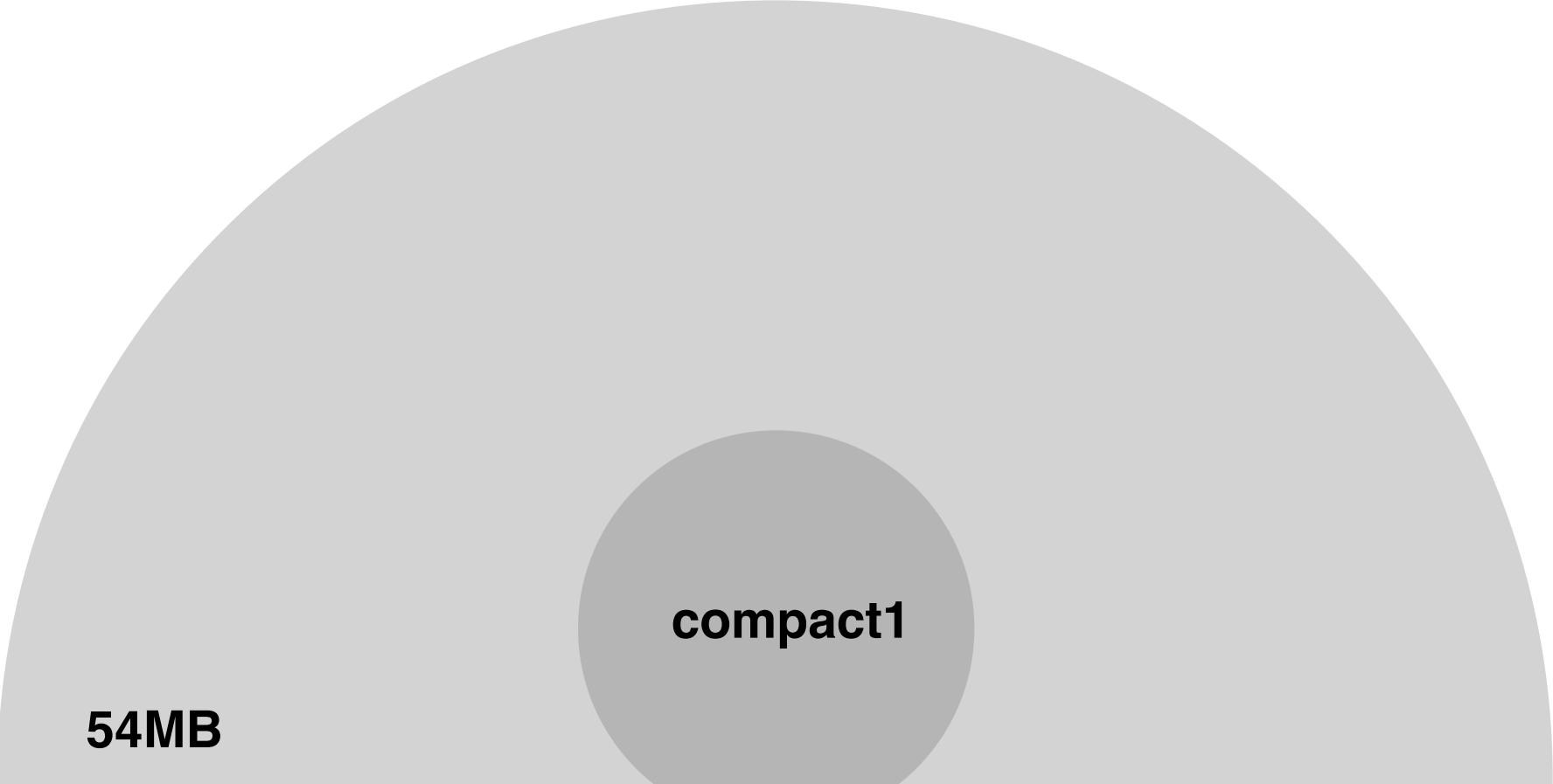






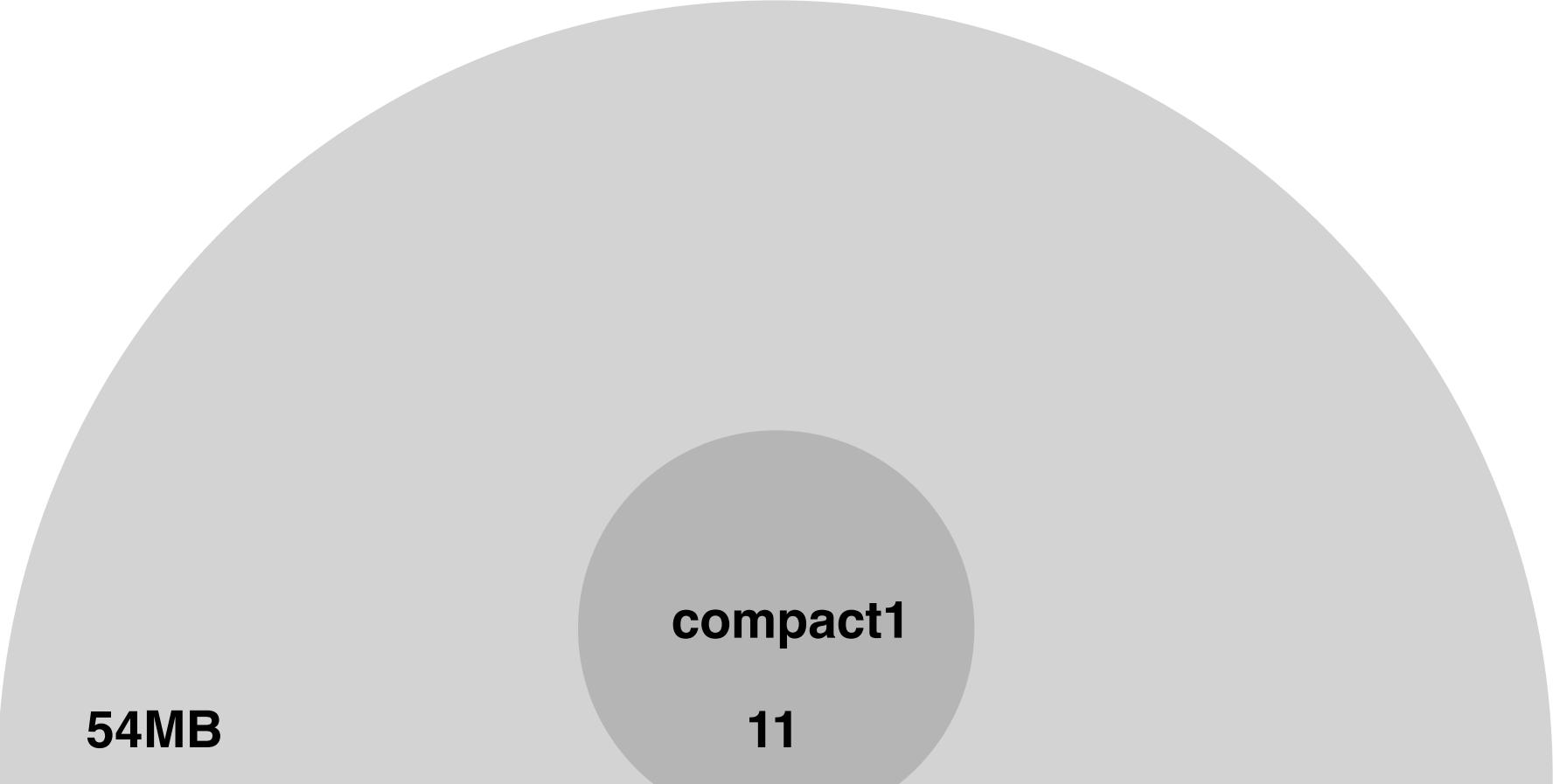


54MB



compact1

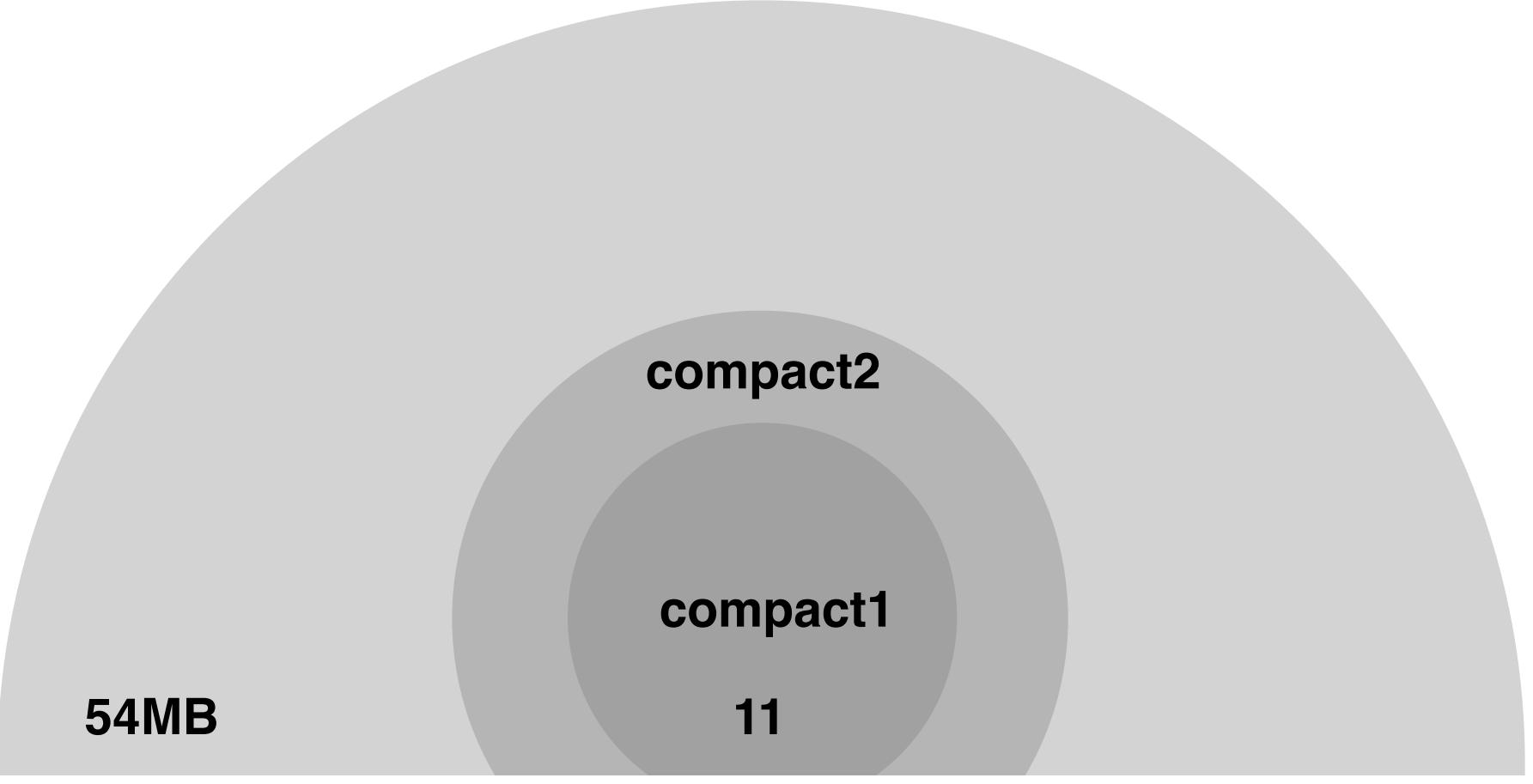
54MB



compact1

11

54MB



compact2

compact1

11

54MB

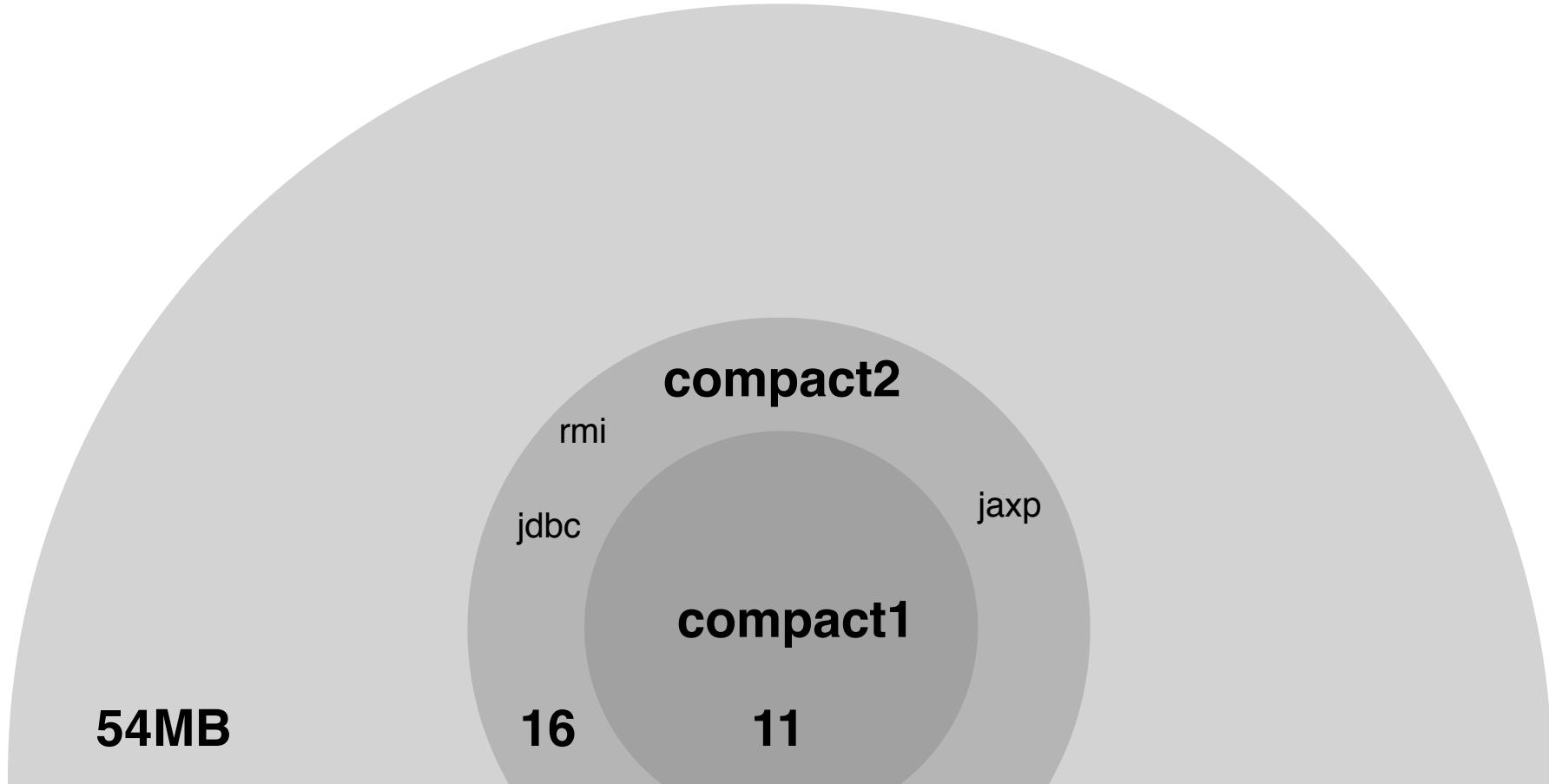
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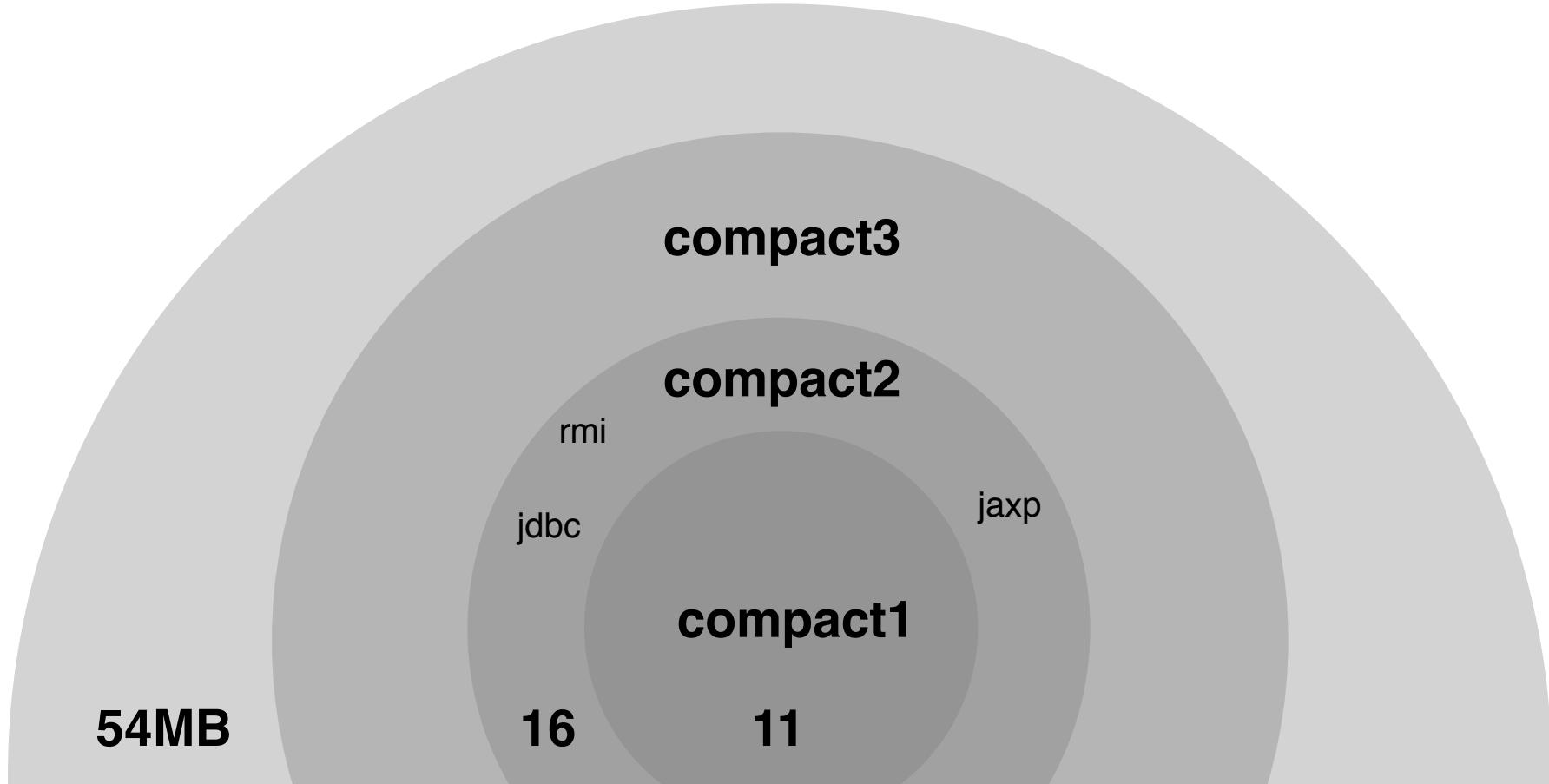
compact2

rmi
jdbc
jaxp

compact1

11





54MB

16

compact1

11

compact3

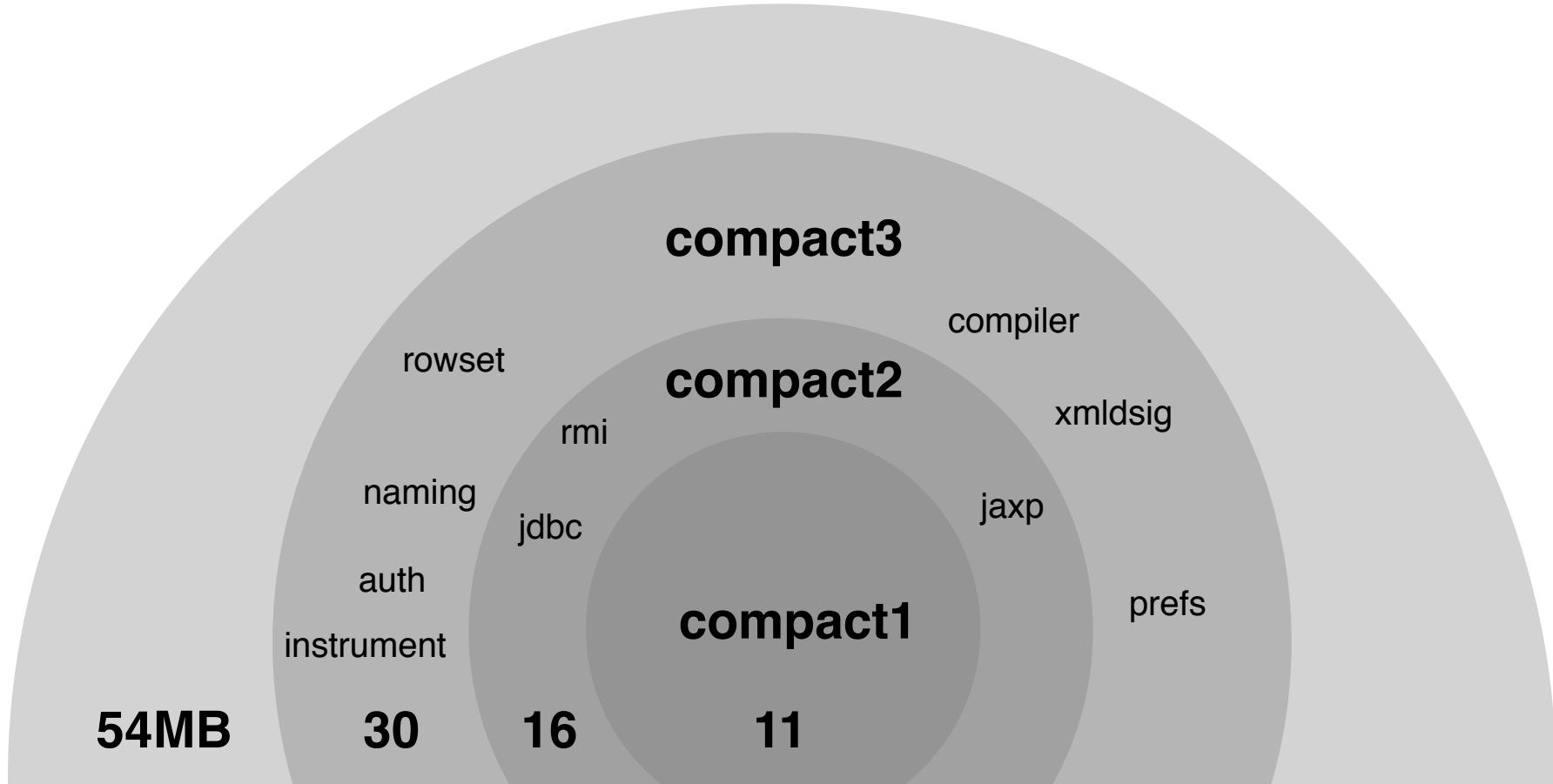
compact2

compact1

rowset
naming
auth
instrument

rmi
jdbc

compiler
xmlsig
jaxp
prefs



JRE

compact3

compact2

compact1

54MB

30

16

11

rowset

rmi

naming

auth

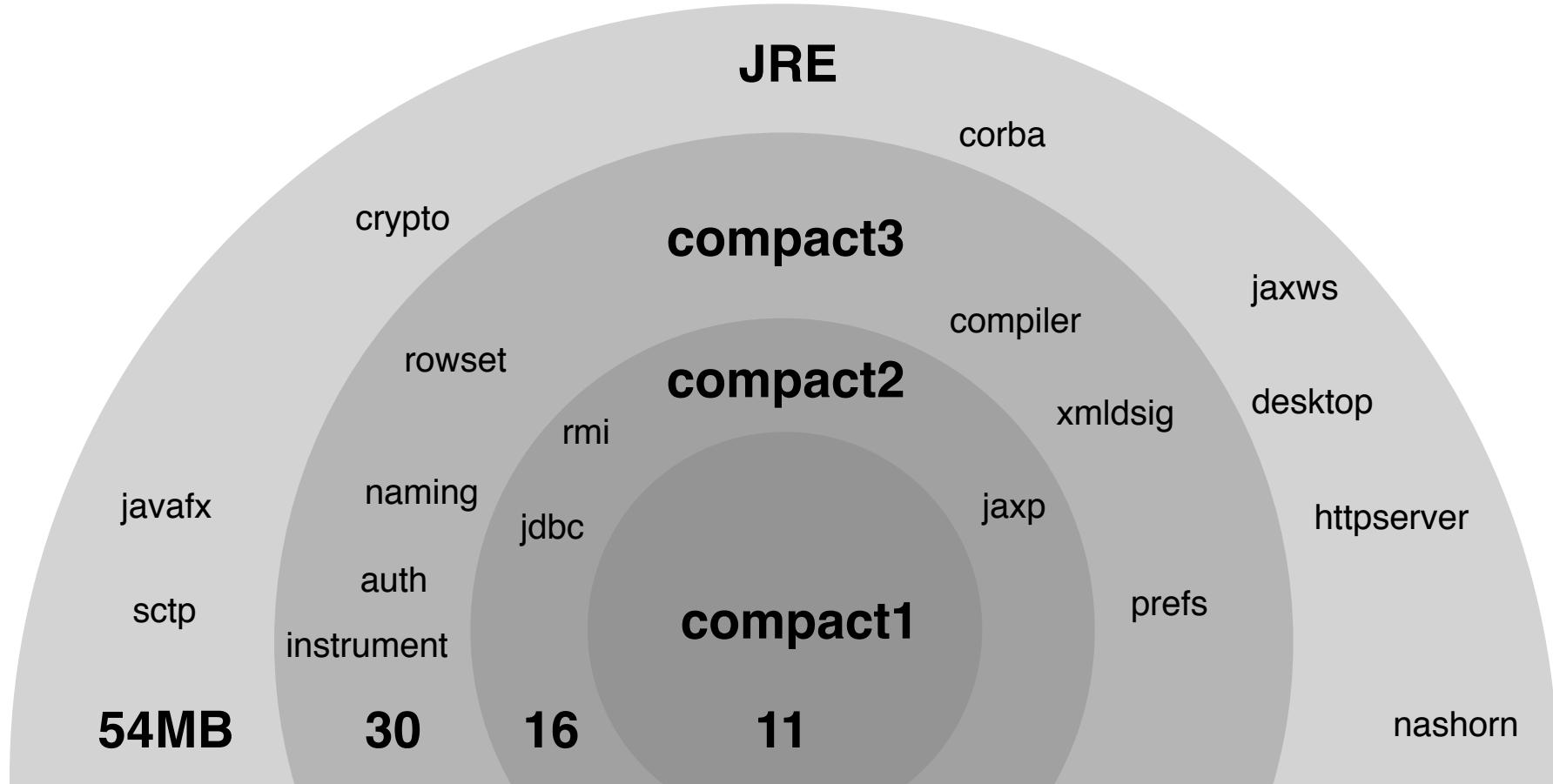
instrument

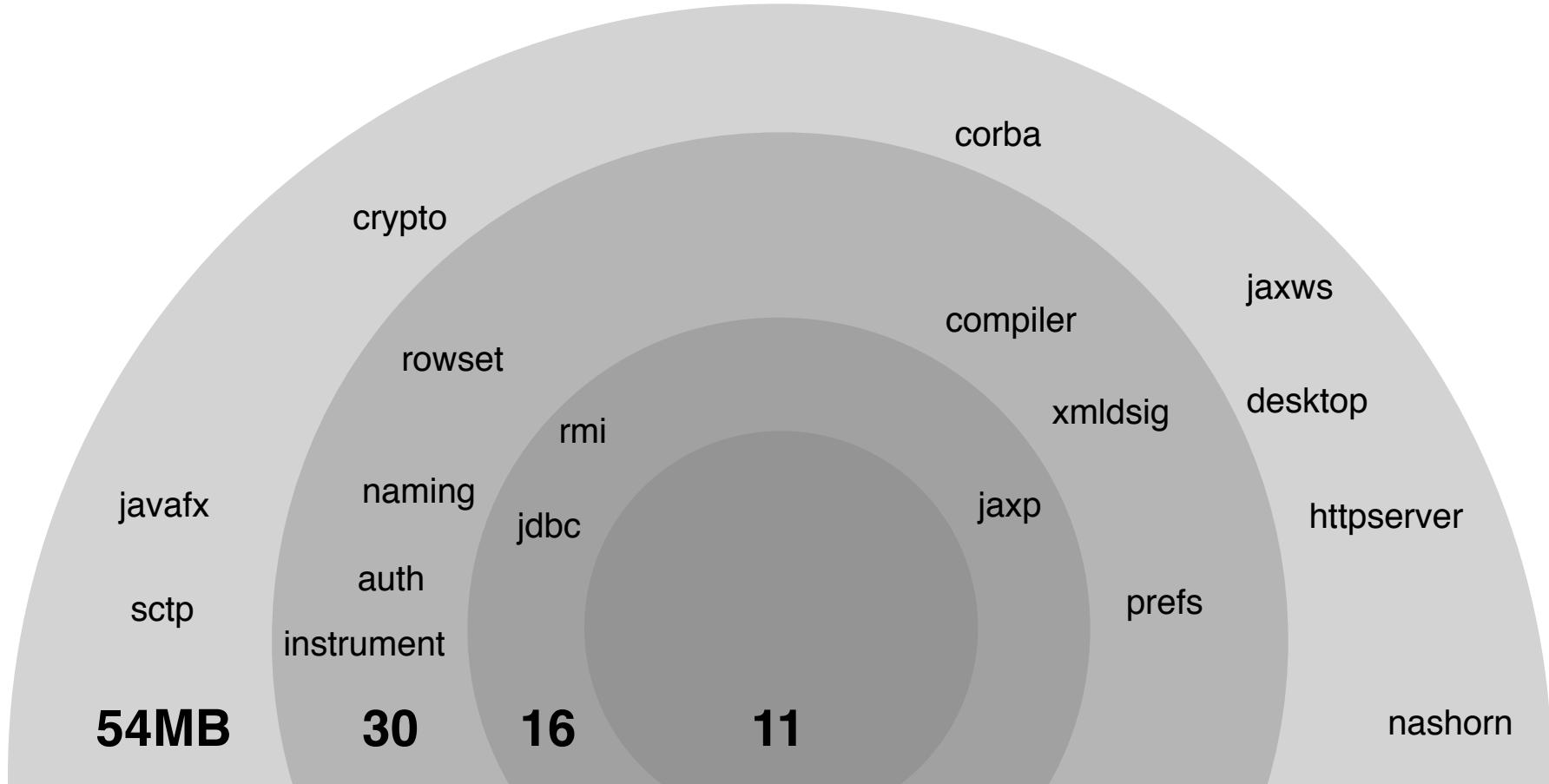
compiler

xmldsig

jaxp

prefs





54MB

30

16

11

script

base

jta

logging

tls

jdbc

rmi

rowset

naming

auth

instrument

javafx

sctp

crypto

management.iiop

cosnaming

kerberos

management

corba

tools.jre

jaxws

desktop

xmldsig

httpserver

jx.annotations

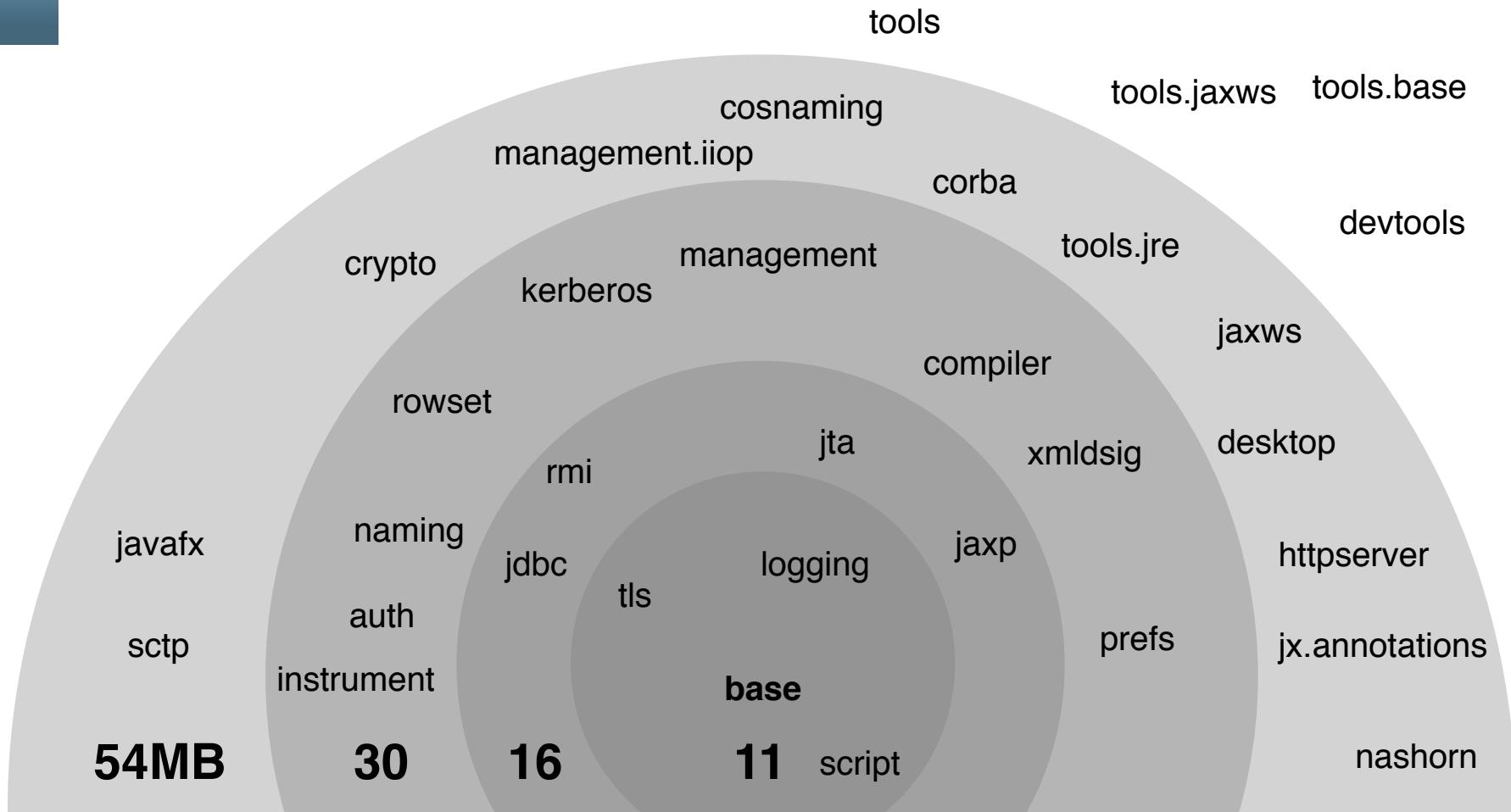
nashorn

compiler

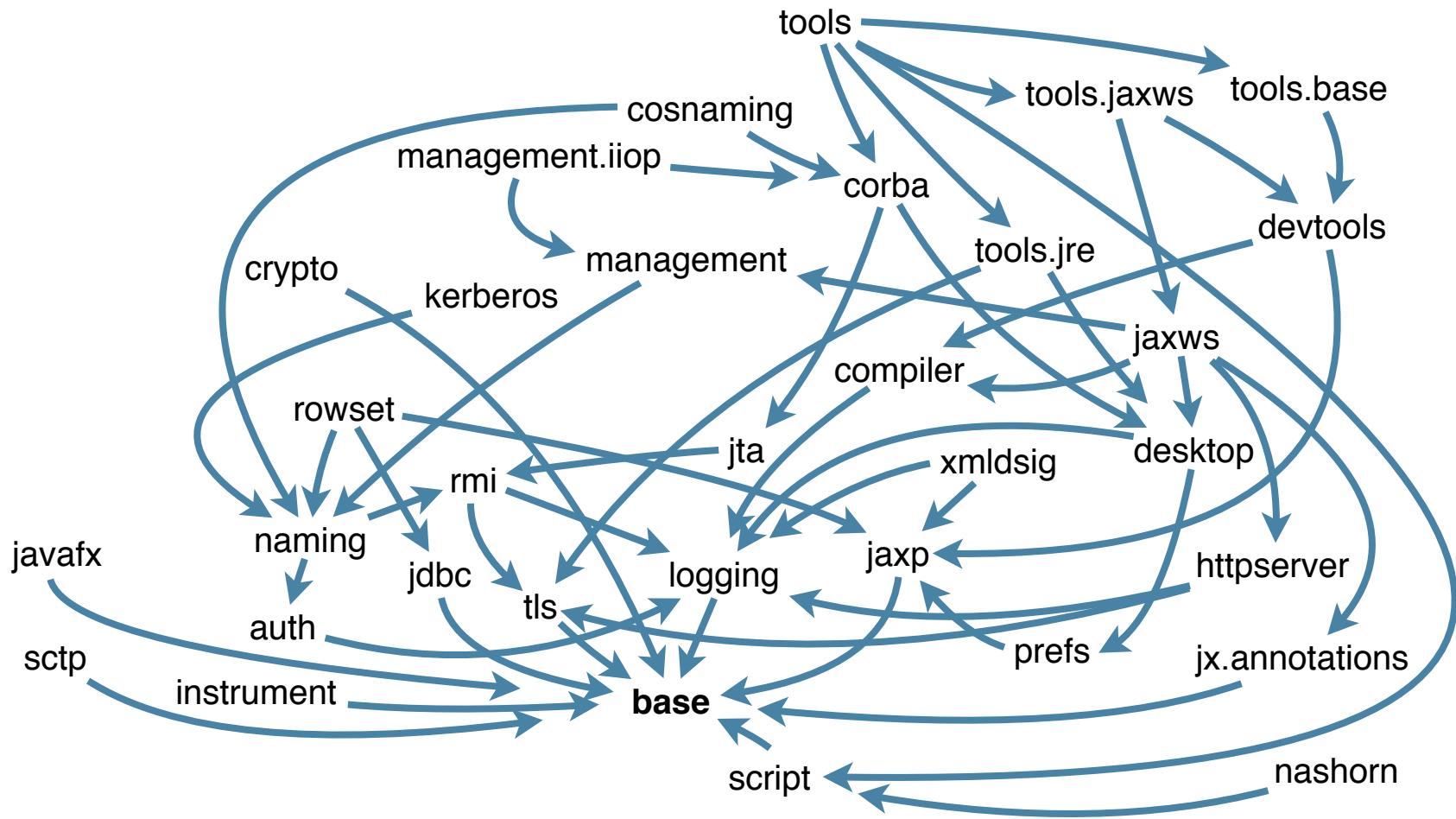
jaxp

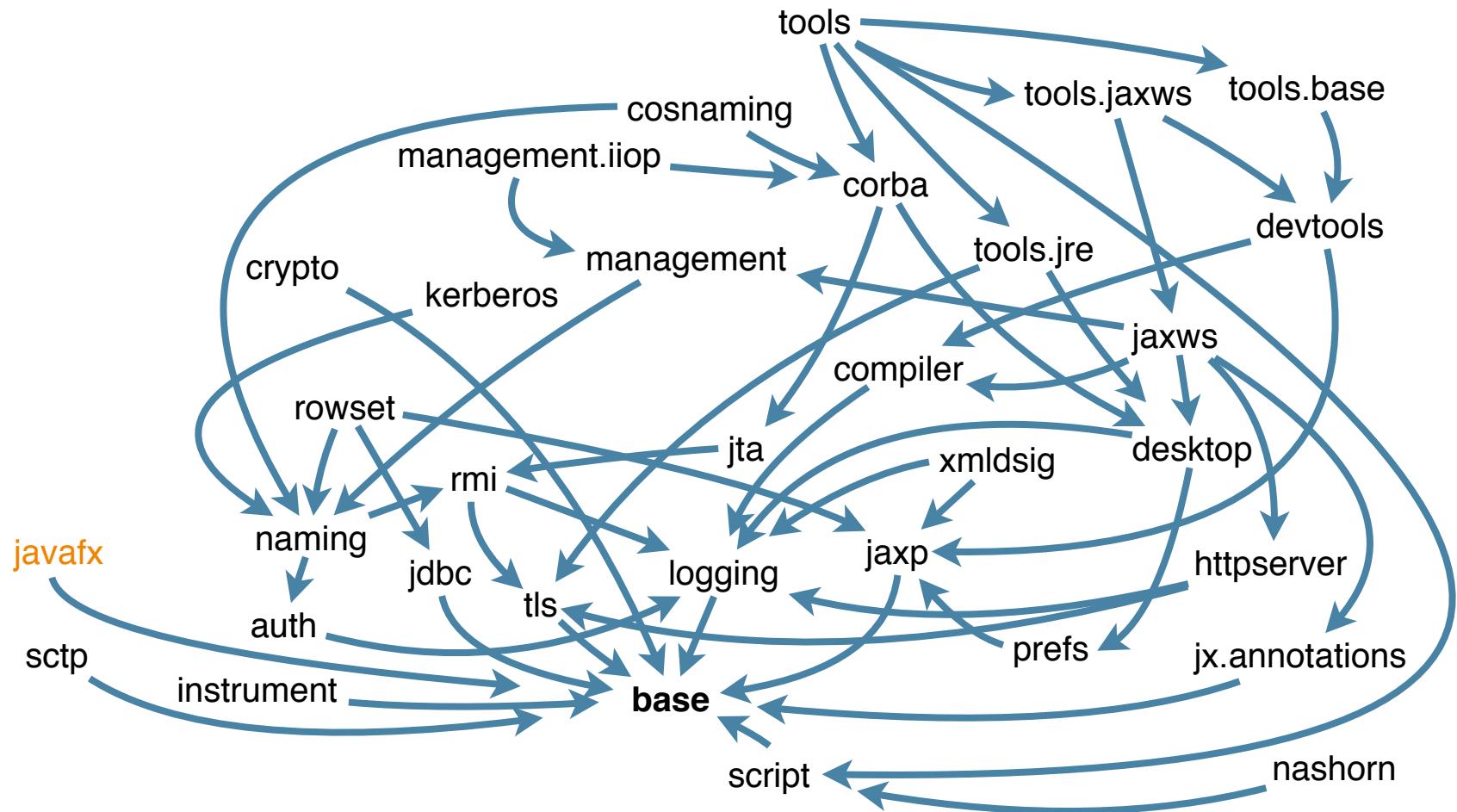
prefs

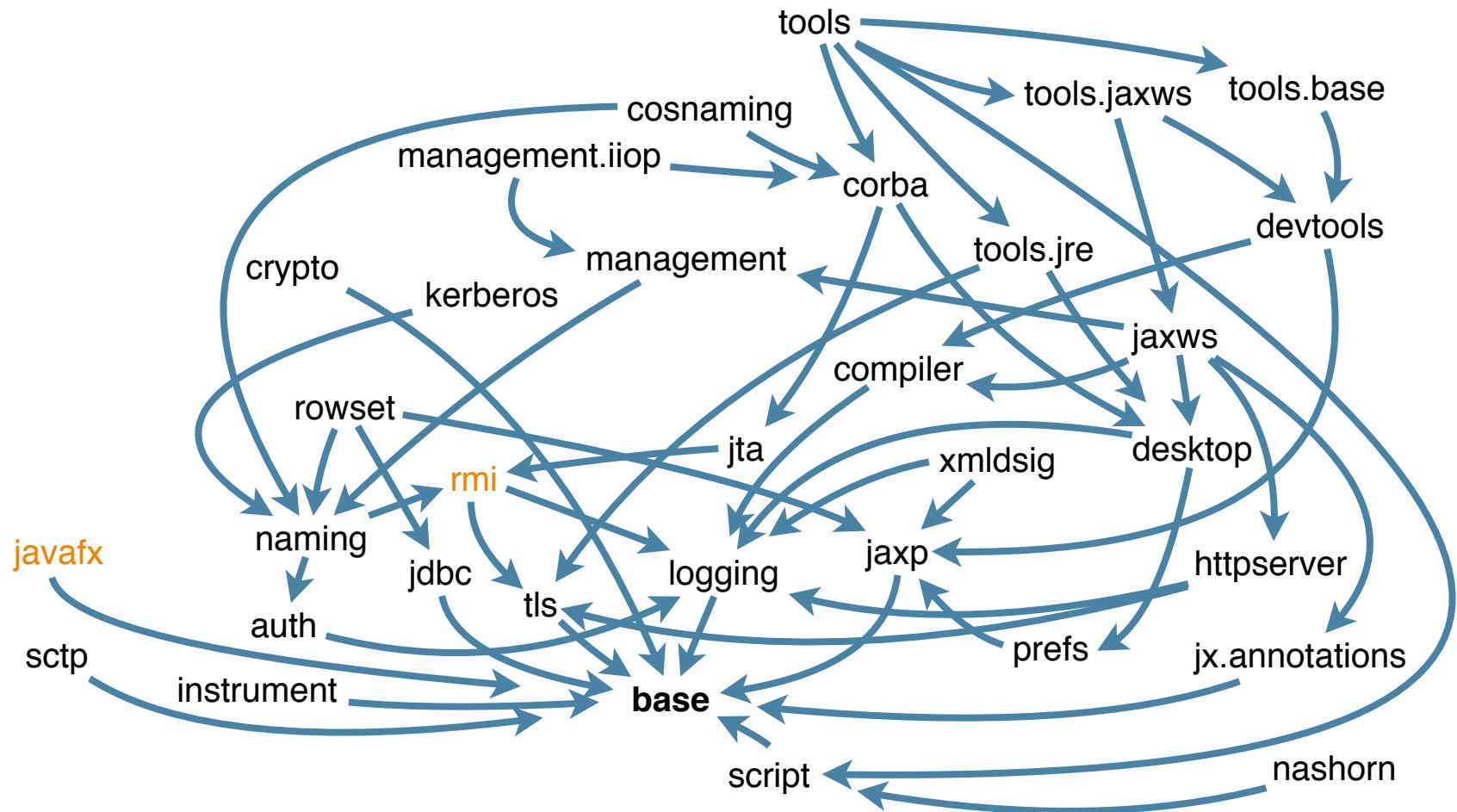


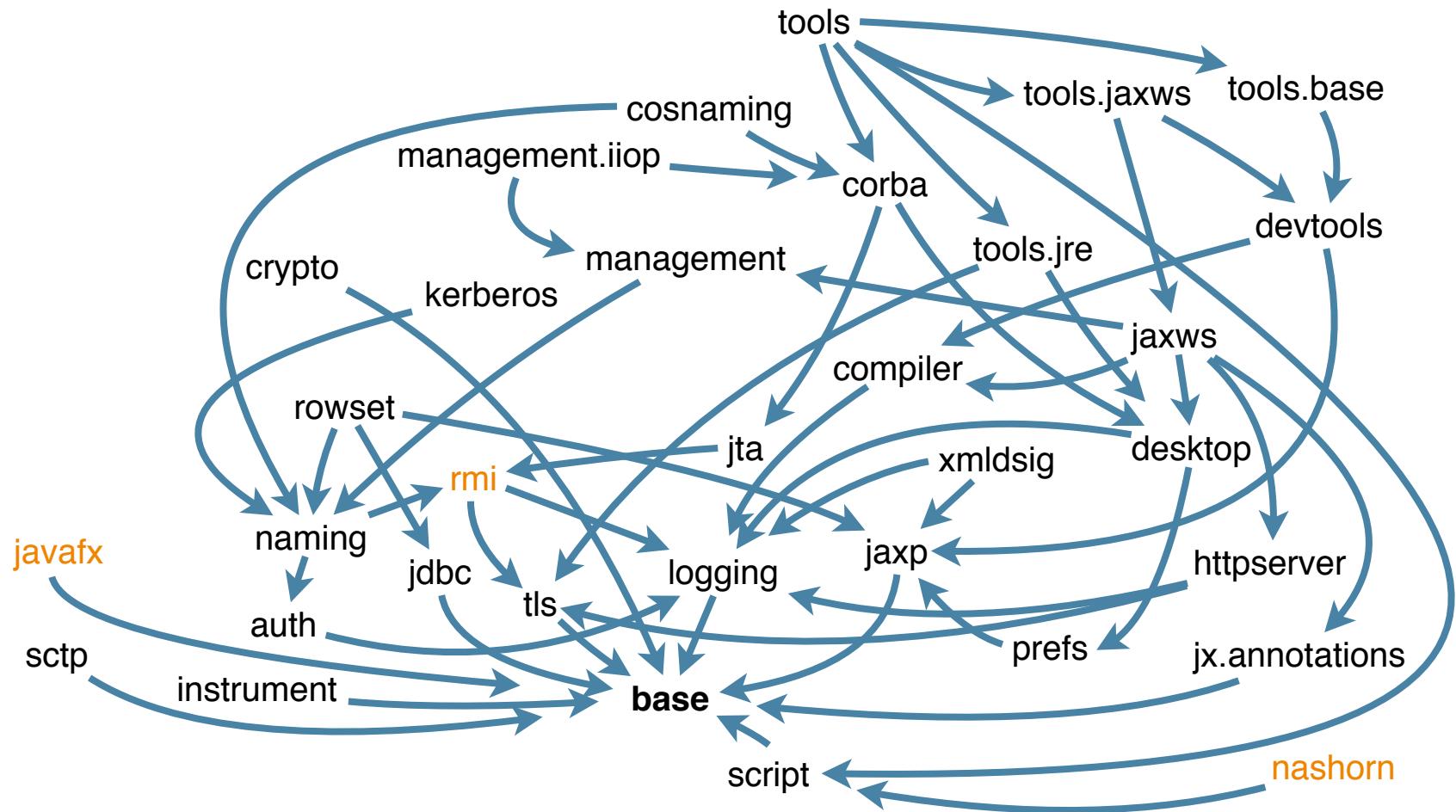


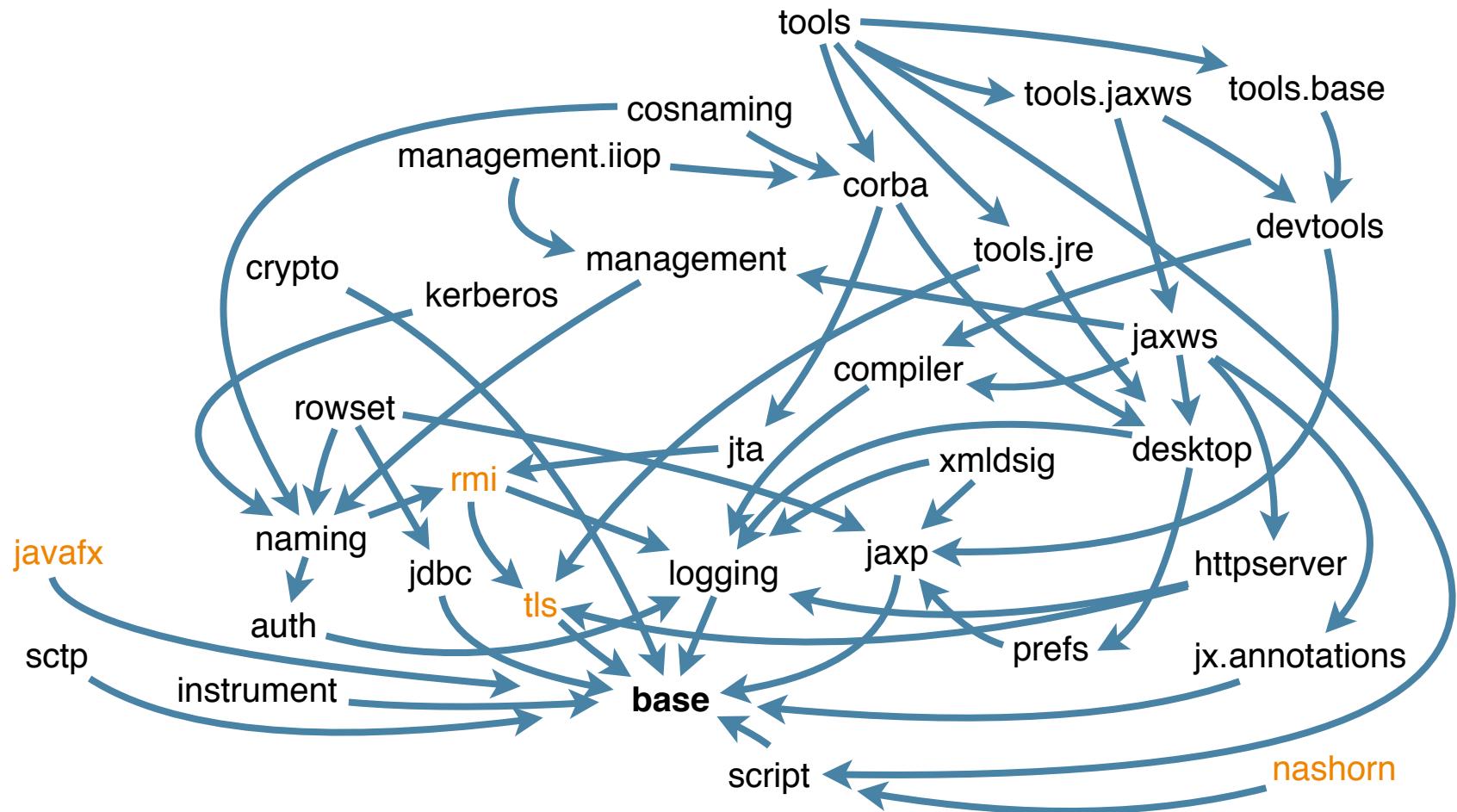
					tools		
				cosnaming		tools.jaxws	tools.base
		management.iiop			corba		
	crypto		management			tools.jre	devtools
		kerberos					
					compiler		jaxws
		rowset					
			rmi	jta		xmldsig	desktop
javafx		naming					
			jdbc	logging	jaxp		httpserver
	sctp	auth					
			tls				
						prefs	jx.annotations
		instrument		base			
					script		nashorn

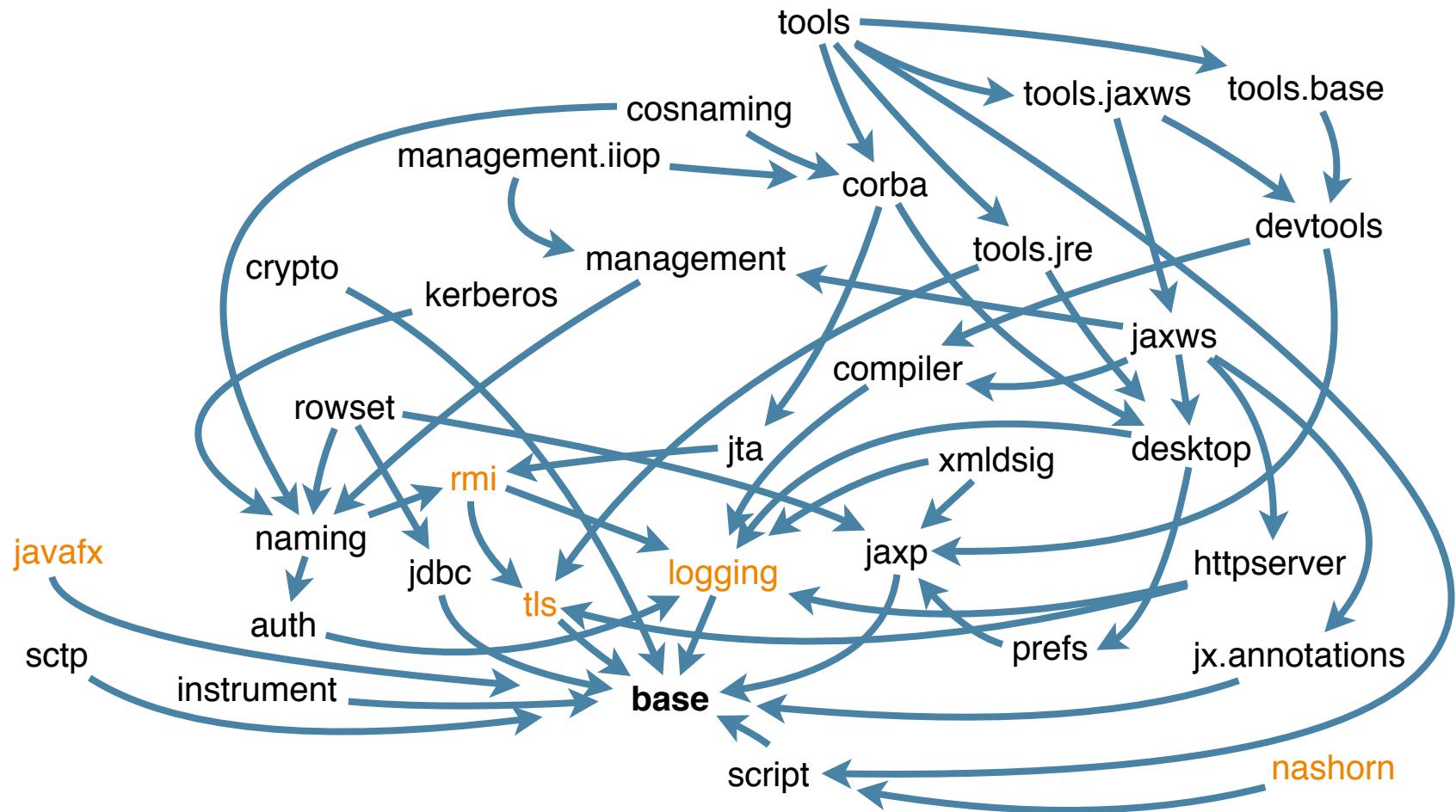


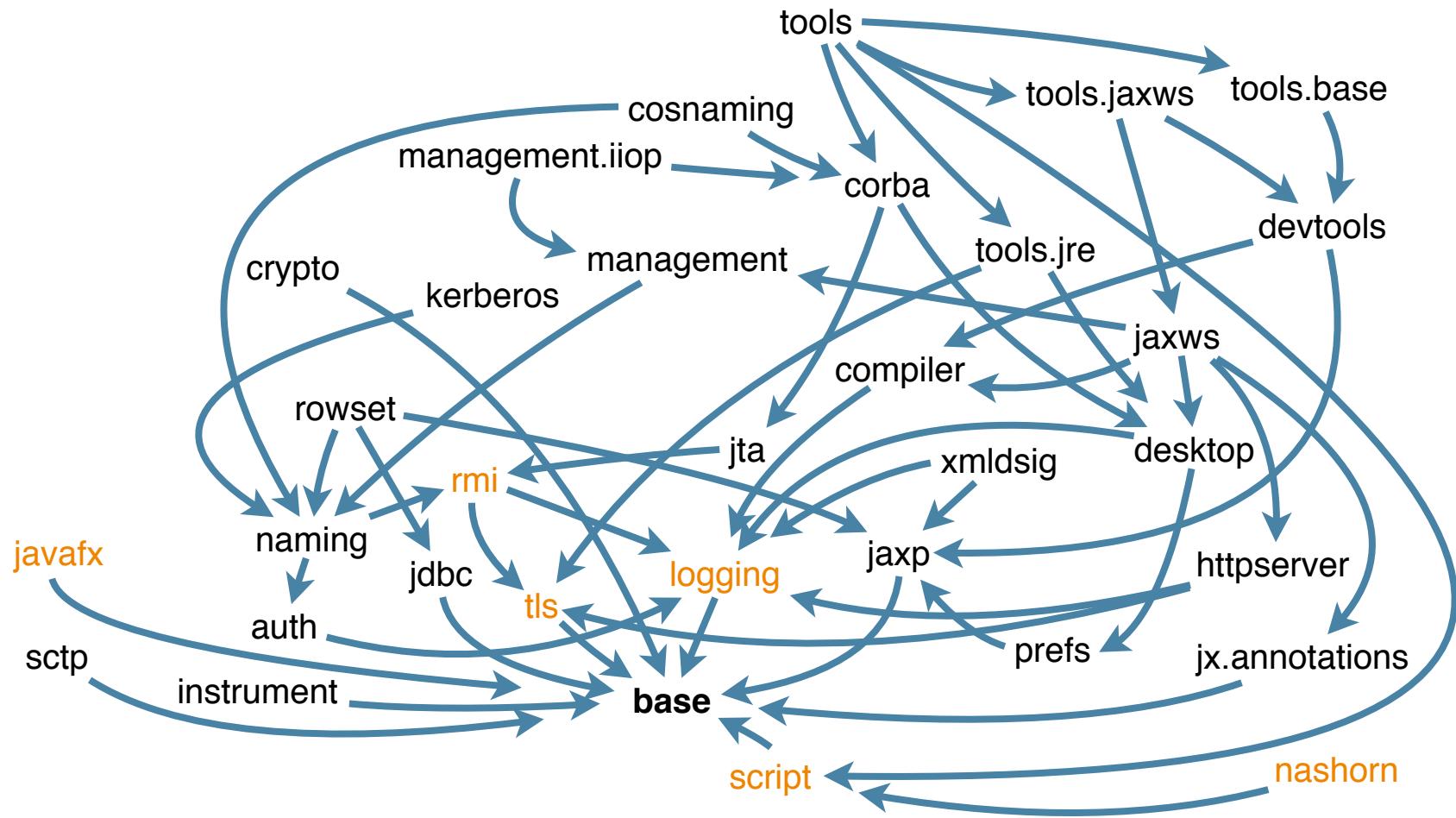


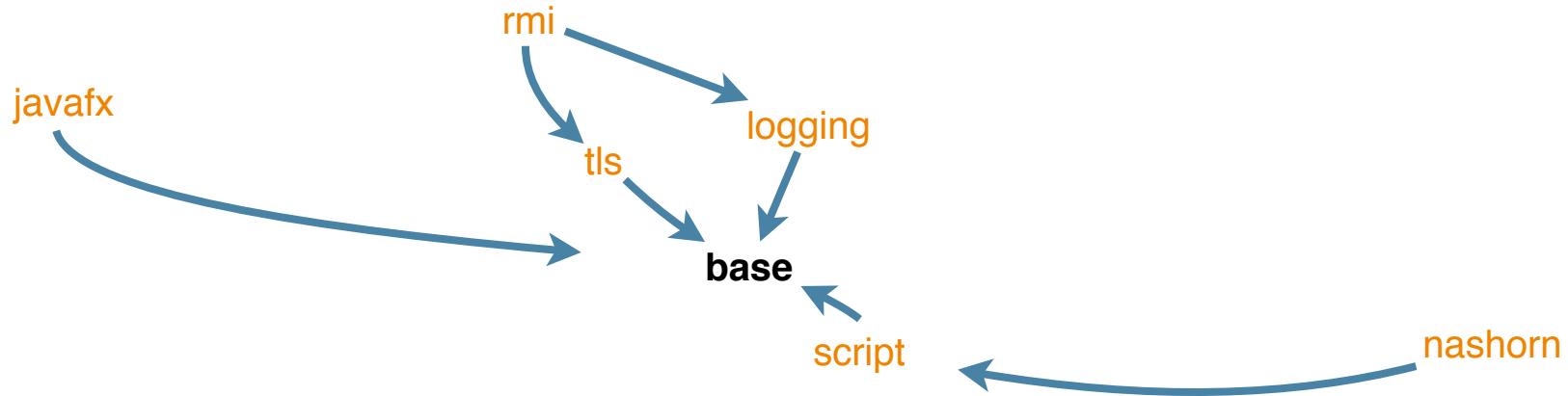












*.jmod

*.jmod

\$JRE/bin/java
/lib/...

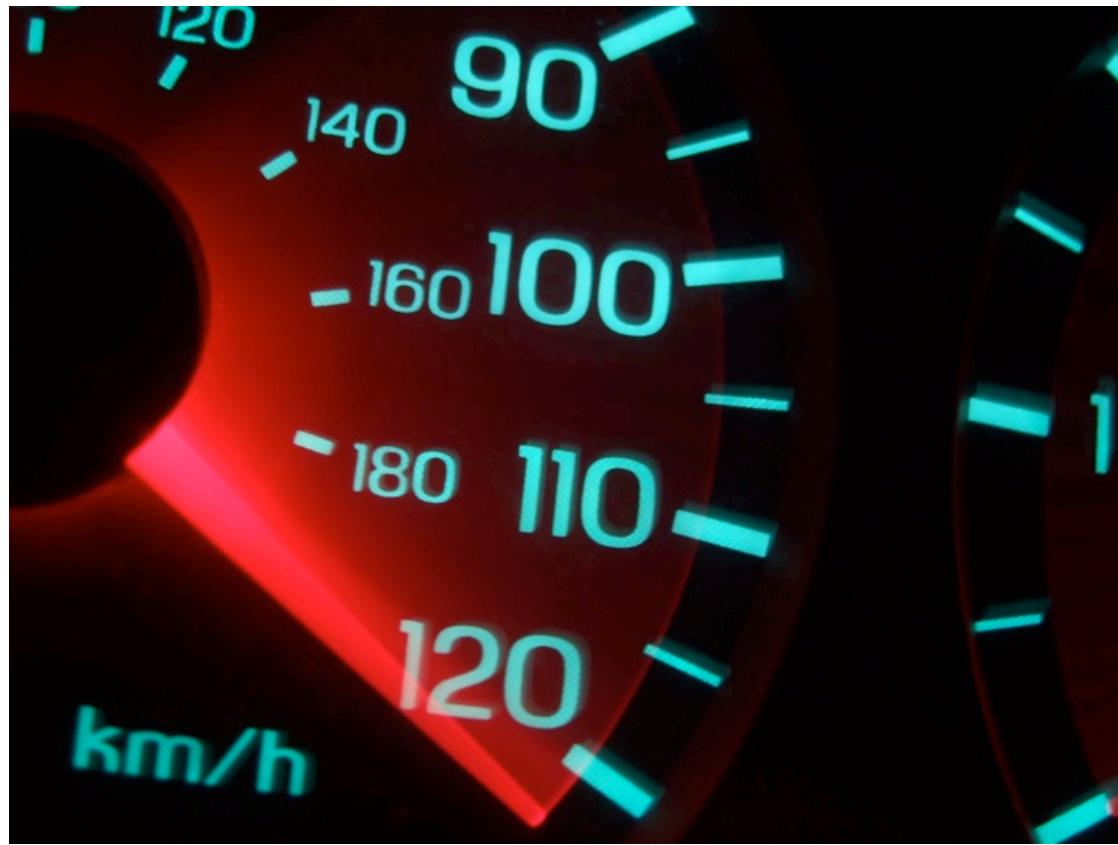



```
$ jlink -mods javafx,rmi,nashorn -d $JRE
```

```
$ jlink -mods javafx,rmi,nashorn -d $JRE  
$ $JRE/bin/java -jar app.jar:.... ....
```

```
$ jlink -mods javafx,rmi,nashorn -d $JRE  
$ $JRE/bin/java -jar app.jar:.... ....  
  
$ javac -mods javafx,rmi,nashorn -d classes *.java
```

```
$ jlink -mods javafx,rmi,nashorn -d $JRE  
$ $JRE/bin/java -jar app.jar:.... ....  
  
$ javac -mods javafx,rmi,nashorn -d classes *.java  
  
$ java -mods javafx,rmi,nashorn -jar app.jar:.... ....
```



Fast class lookup

Fast class lookup
Aggressive inlining

Fast class lookup
Aggressive inlining
Ahead-of-time compilation

Fast class lookup

Aggressive inlining

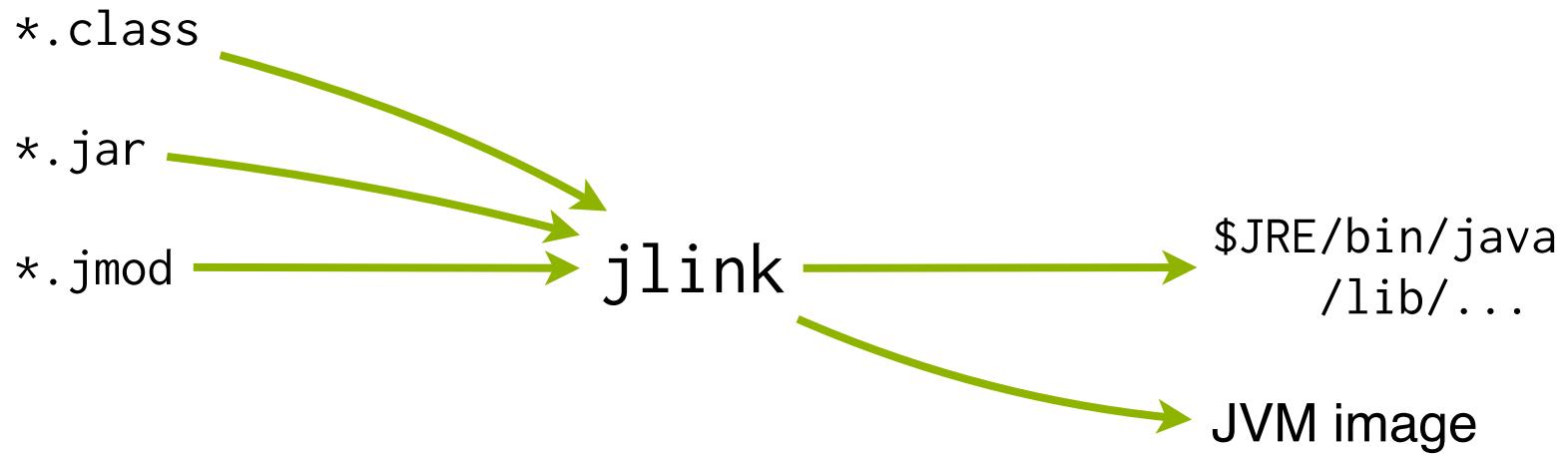
Ahead-of-time compilation

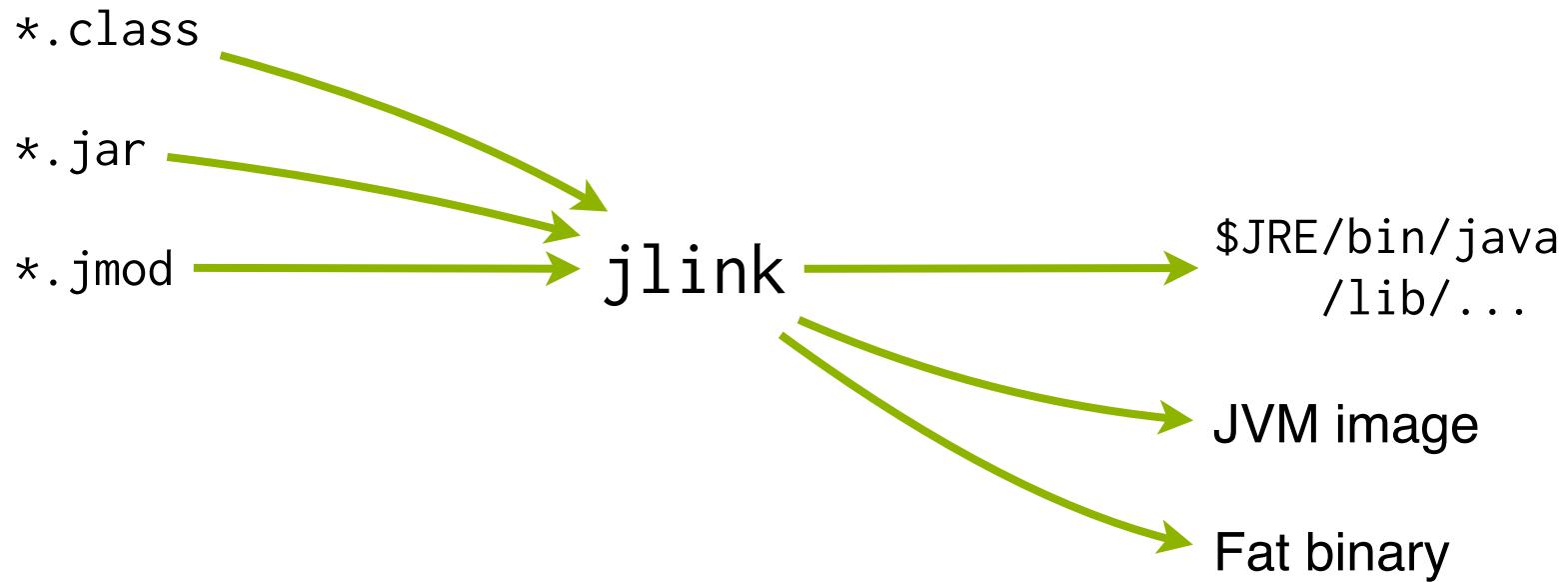
JVM-specific memory images

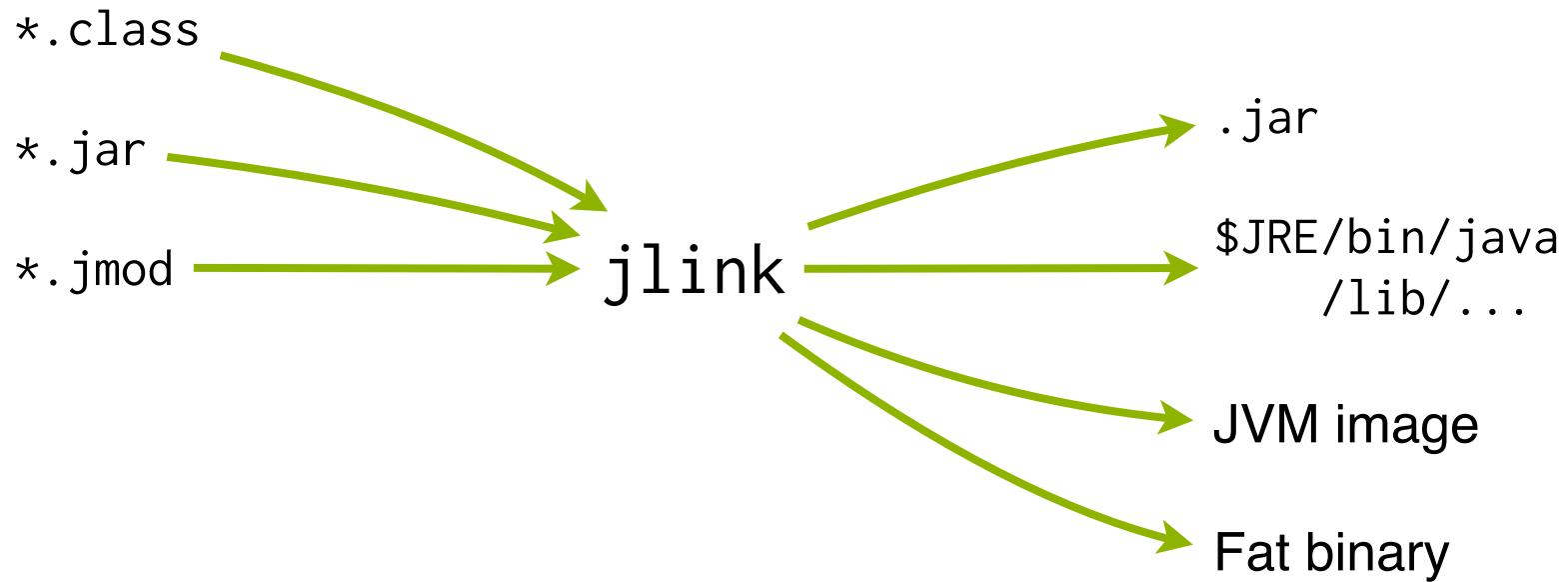
- Fast class lookup
- Aggressive inlining
- Ahead-of-time compilation
- JVM-specific memory images
- Removal of unused fields/methods/classes

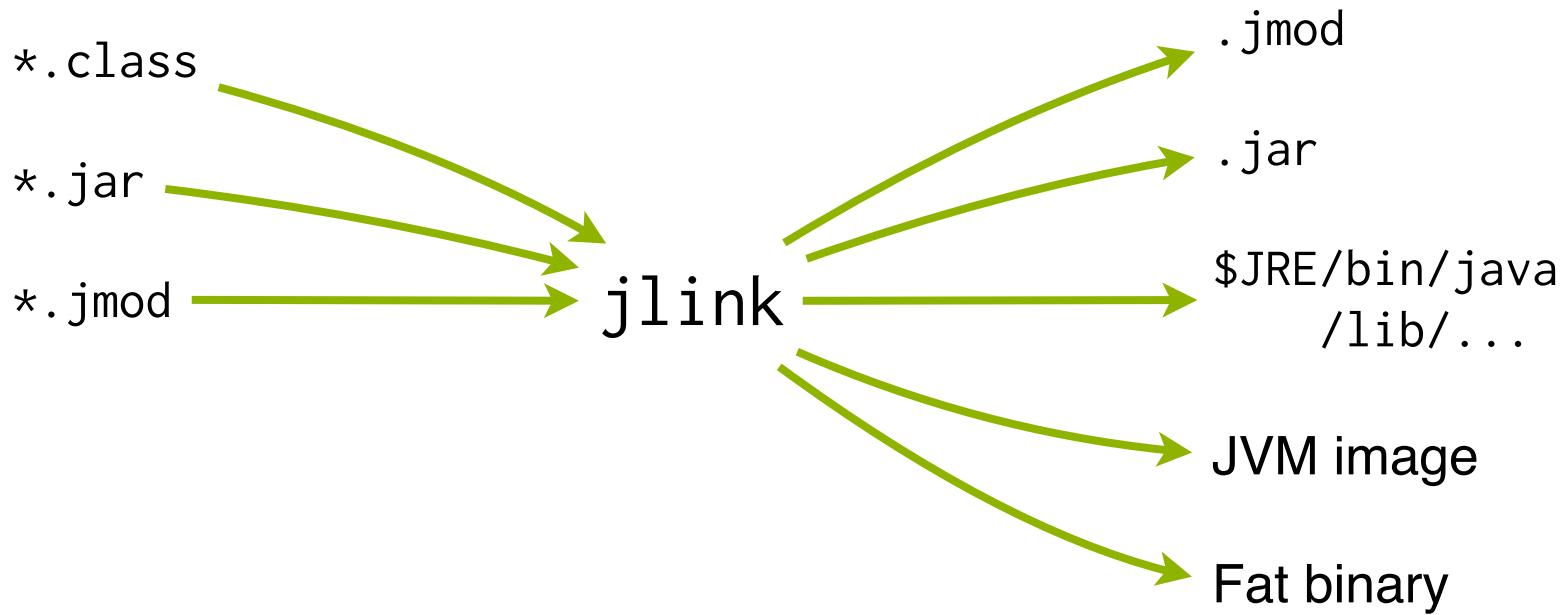













```
$ jlink -mods javafx,rmi,nashorn -cp app.jar -d $JRE
```

```
$ jlink -mods javafx,rmi,nashorn -cp app.jar -d $JRE  
$ $JRE/bin/app ...
```

```
$ jlink -mods javafx,rmi,nashorn -cp app.jar -d $JRE  
$ $JRE/bin/app ...  
  
$ jlink -mods javafx,rmi,nashorn -cp app.jar -o app.jai
```

```
$ jlink -mods javafx,rmi,nashorn -cp app.jar -d $JRE  
$ $JRE/bin/app ...  
  
$ jlink -mods javafx,rmi,nashorn -cp app.jar -o app.jai  
$ java -jai app.jai
```

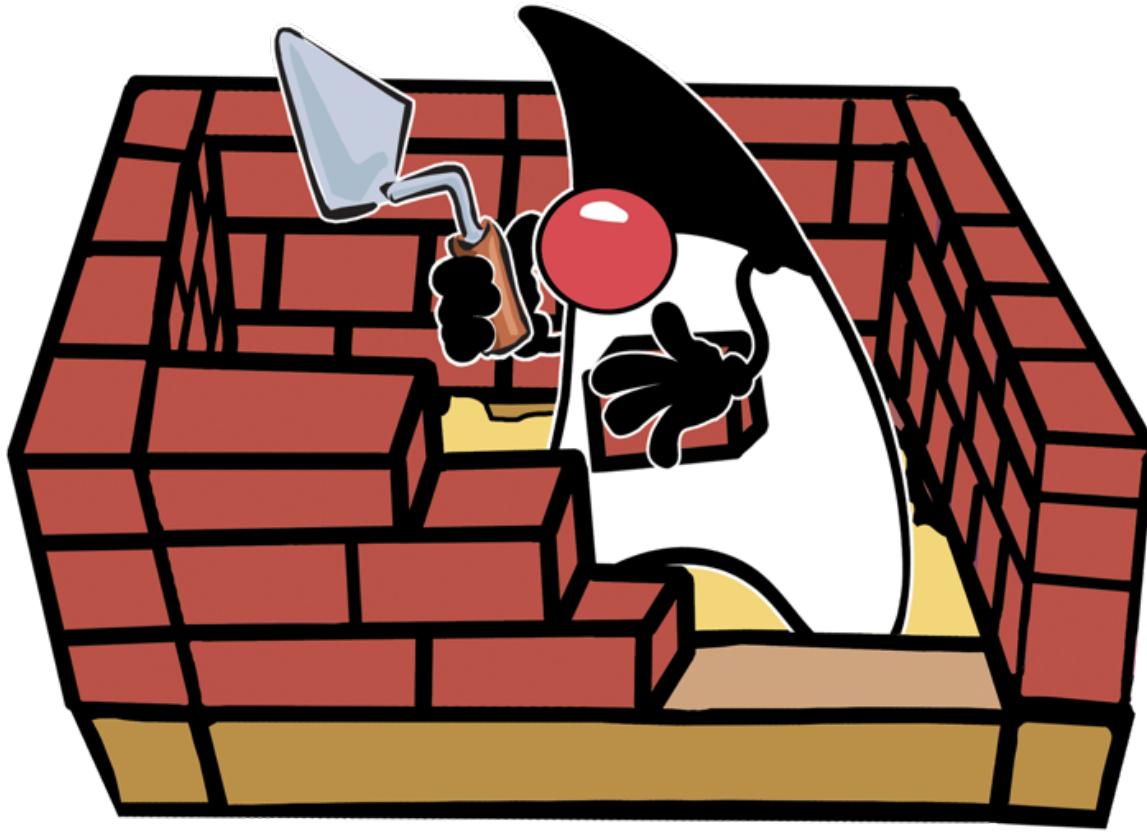



rt.jar
tools.jar



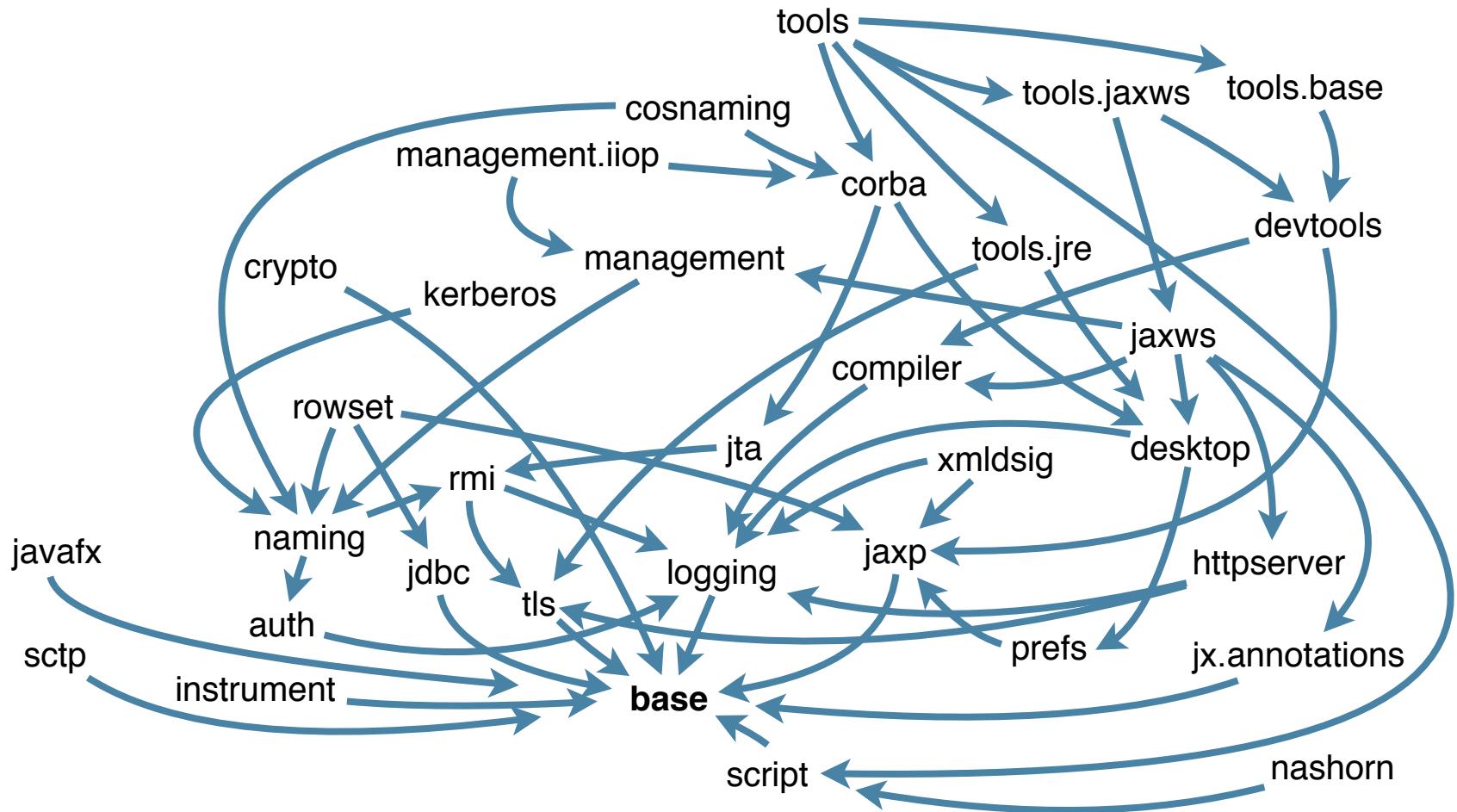


\$JRE/bin/
/conf/
/ext/
/include/
/lib/\$ARCH/*.so
 /\$VM/*.so
/modules/



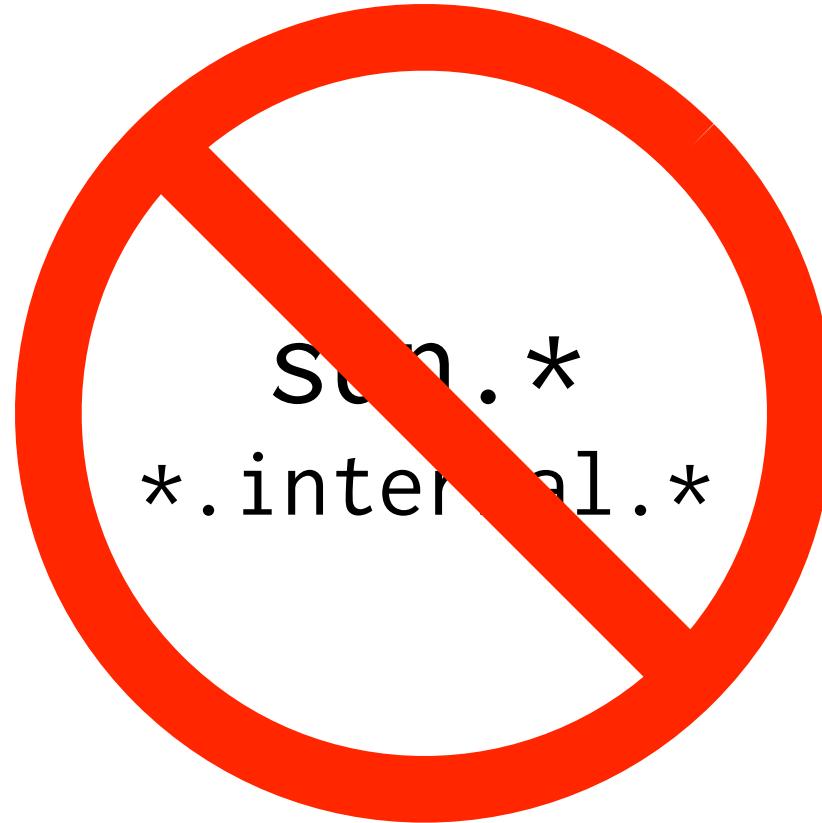
java.io	java.util.jar	sun.net.ftp	sun.security.pkcs12
java.lang	java.util.regex	sun.net.ftp.impl	sun.security.provider
java.lang.annotation	java.util.spi	sun.net.idn	sun.security.provider.certpath
java.lang.invoke	java.util.stream	sun.net.sdp	sun.security.rsa
java.lang.ref	java.util.zip	sun.net.smtp	sun.security.timestamp
java.lang.reflect	javax.crypto	sun.net.spi	sun.security.util
java.math	javax.crypto.interfaces	sun.net.spi.nameservice	sun.security.validator
java.net	javax.crypto.spec	sun.net.util	sun.security.x509
java.nio	javax.security.auth	sun.net.www	sun.text
java.nio.channels	javax.security.auth.callback	sun.net.www.content.text	sun.text.bidi
java.nio.channels.spi	javax.security.auth.login	sun.net.www.http	sun.text.normalizer
java.nio.charset	javax.security.auth.spi	sun.net.www.protocol.file	sun.text.resources
java.nio.charset.spi	javax.security.auth.x500	sun.net.www.protocol.ftp	sun.text.resources.cldr
java.nio.file	jdk	sun.net.www.protocol.http	sun.text.resources.cldr.en
java.nio.file.attribute	jdk.internal.org.objectweb.asm	sun.net.www.protocol.jar	sun.text.resources.en
java.nio.file.spi	jdk.internal.org.xml.sax	sun.net.www.protocol.mailto	sun.util
java.security	jdk.internal.util.xml	sun.net.www.protocol.netdoc	sun.util.calendar
java.security.cert	jdk.internal.util.xml.impl	sun.nio	sun.util.cldr
java.security.interfaces	jdk.jigsaw.module	sun.nio.ch	sun.util.locale
java.security.spec	jdk.jigsaw.tools.jlink	sun.nio.cs	sun.util.locale.provider
java.text	jdk.joptsimple	sun.nio.fs	sun.util.logging
java.text.spi	jdk.joptsimple.internal	sun.reflect	sun.util.logging.resources
java.time	jdk.joptsimple.util	sun.reflect.annotation	sun.util.resources
java.time.chrono	sun.invoke	sun.reflect.generics.factory	sun.util.resources.cldr
java.time.format	sun.invoke.anon	sun.reflect.generics.parser	sun.util.resources.cldr.en
java.time.temporal	sun.invoke.empty	sun.reflect.generics.scope	sun.util.resources.en
java.time.zone	sun.invoke.util	sun.reflect.generics.tree	sun.util.spi
java.util	sun.launcher	sun.reflect.generics.visitor	
java.util.concurrent	sun.launcher.resources	sun.reflect.misc	
java.util.concurrent.atomic	sun.misc	sun.security.action	
java.util.concurrent.locks	sun.misc.resources	sun.security.jca	
java.util.function	sun.net	sun.security.pkcs	

java.io
java.lang
java.lang.annotation
java.lang.invoke
java.lang.ref
java.lang.reflect
java.math
java.net
java.nio
java.nio.channels
java.nio.channels.spi
java.nio.charset
java.nio.charset.spi
java.nio.file
java.nio.file.attribute
java.nio.file.spi
java.security
java.security.cert
java.security.interfaces
java.security.spec
java.text
java.text.spi
java.time
java.time.chrono
java.time.format
java.time.temporal
java.time.zone
java.util
java.util.concurrent
java.util.concurrent.atomic
java.util.concurrent.locks
java.util.function
java.util.jar
java.util.regex
java.util.spi
java.util.stream
java.util.zip
javax.crypto
javax.crypto.interfaces
javax.crypto.spec
javax.security.auth
javax.security.auth.callback
javax.security.auth.login
javax.security.auth.spi
javax.security.auth.x500
jdk
jdk.internal.org.objectweb.ecastor
jdk.internal.org.omg.CORBA
jdk.internal.util.xml
jdk.internal.util.xml.impl
jdk.jigsaw.module
jdk.jigsaw.tools.jlink
jdk.joptsimple
jdk.joptsimple.internal
jdk.joptsimple.util
sun.invoke
sun.invoke.anon
sun.invoke.empty
sun.invoke.util
sun.launcher
sun.launcher.resources
sun.misc
sun.misc.resources
sun.net
sun.net.ftp
sun.net.ftp.impl
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sun.net.sdp
sun.net.smtp
sun.net.spi
sun.net.spi.nameservice
sun.net.util
sun.net.www
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sun.net.www.protocol.file
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sun.net.www.protocol.https
sun.net.www.protocol.https
sun.net.www.protocol.https
sun.net.www.protocol.netdoc
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sun.nio.ch
sun.nio.cs
sun.nio.fs
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sun.reflect.annotation
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sun.reflect.generics.parser
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sun.reflect.generics.tree
sun.reflect.generics.visitor
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sun.text.normalizer
sun.text.resources
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sun.text.resources.cldr.en
sun.text.resources.en
sun.util
sun.util.calendar
sun.util.cldr
sun.util.locale
sun.util.locale.provider
sun.util.logging
sun.util.logging.resources
sun.util.resources
sun.util.resources.cldr
sun.util.resources.cldr.en
sun.util.resources.en
sun.util.spi





sun.*
.internal.



Scalability

Performance

Security

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The Modular Java Platform & Project Jigsaw

Mark Reinhold (@mreinhold)
*Chief Architect, Java Platform Group
Oracle*

2014/2/4



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JAVA

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