

Проектирование и реализация каркаса распределенной системы мониторинга и диспетчеризации процессов гетерогенной среды

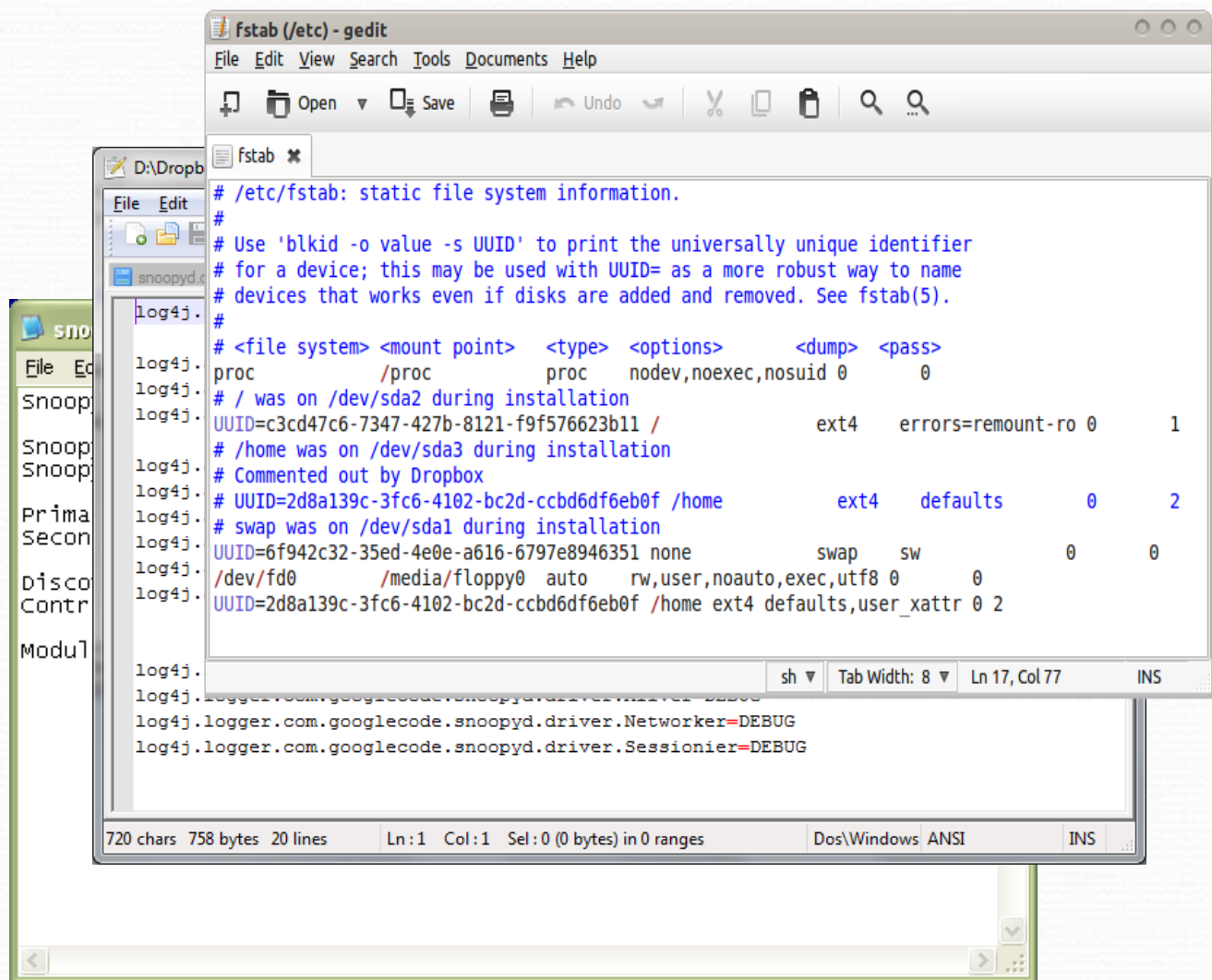
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профессор к.ф-м.н Крючкова Е.Н.,
АлтГТУ / ПОВТ

Сложность восприятия текстовой информации

```
C:\snoopd>snoopd.cmd
com.googlecode.snoopd.core.Snoopd - running snoopd 0.0.0
com.googlecode.snoopd.core.Kernel - init kernel drivers
com.googlecode.snoopd.core.Kernel - init kernel adapters
com.googlecode.snoopd.core.Kernel - init primary ice adapter
com.googlecode.snoopd.core.Kernel - primary adapter endpoints is a "tcp -h 192.168.0.10 -p 10000"
com.googlecode.snoopd.core.Kernel - init secondary ice adapter
com.googlecode.snoopd.core.Kernel - primary secondary endpoints is a "udp -h 192.168.0.10 -p 10000"
com.googlecode.snoopd.core.Kernel - init kernel listeners
com.googlecode.snoopd.core.Kernel - init kernel filters
com.googlecode.snoopd.core.Kernel - init kernel rate
com.googlecode.snoopd.core.Kernel - init self session
com.googlecode.snoopd.core.Kernel - starting kernel thread
com.googlecode.snoopd.core.Snoopd - ... identity: dev/9dbaaa52-8902-4cd7-89b7-1252a6a247ca
com.googlecode.snoopd.core.Snoopd - ... hostname: Node3
com.googlecode.snoopd.core.Snoopd - ... rate: 17
com.googlecode.snoopd.core.Snoopd - setting shutdown hook for snoopd
com.googlecode.snoopd.core.Snoopd - fetching kernel drivers:
com.googlecode.snoopd.core.Snoopd - ... Sessionier
com.googlecode.snoopd.core.Snoopd - ... Maduler
com.googlecode.snoopd.core.Snoopd - ... Aliver
com.googlecode.snoopd.core.Snoopd - ... Networker
com.googlecode.snoopd.core.Snoopd - ... Resulter
com.googlecode.snoopd.core.Snoopd - ... Configurer
com.googlecode.snoopd.core.Snoopd - ... Hoster
com.googlecode.snoopd.core.Snoopd - ... Scheduler
com.googlecode.snoopd.core.Snoopd - ... Controller
com.googlecode.snoopd.core.Snoopd - ... Discoverer
com.googlecode.snoopd.core.Snoopd - fetching drivers adapters:
com.googlecode.snoopd.core.Snoopd - ... DiscovererAdapter
com.googlecode.snoopd.core.Snoopd - ... SessionierAdapter
com.googlecode.snoopd.core.Kernel - handle SnoopdStartedEvent with SuspenseHandler
com.googlecode.snoopd.core.Kernel - init kernel
com.googlecode.snoopd.core.Kernel - ... activating Networker
com.googlecode.snoopd.core.Kernel - ... activating Scheduler
com.googlecode.snoopd.core.Kernel - handle NetworkEnabledEvent with SuspenseHandler
com.googlecode.snoopd.core.Kernel - handle KernelStateChangedEvent with SuspenseHandler
com.googlecode.snoopd.core.Kernel - changing kernel state on OnlineState
com.googlecode.snoopd.core.Kernel - handle DiscoverRecievedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle DiscoverRecievedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle DiscoverRecievedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle DiscoverRecievedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle DiscoverRecievedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle ChildSessionRecievedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle ParentSessionSendedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle ChildSessionSendedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle ParentSessionRecievedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - handle KernelStateChangedEvent with OnlineHandler
com.googlecode.snoopd.core.Kernel - changing kernel state on ActiveState
com.googlecode.snoopd.driver.Aliver - starting Aliver
com.googlecode.snoopd.driver.Resulter - starting Resulter
com.googlecode.snoopd.driver.Resulter - use connection url: null
com.googlecode.snoopd.driver.Aliver - parent node is alive: dev/9dbaaa52-8902-4cd7-89b7-1252a6a247ca
com.googlecode.snoopd.driver.Aliver - child node is alive: dev/9dbaaa52-8902-4cd7-89b7-1252a6a247ca
com.googlecode.snoopd.driver.Resulter - The url cannot be null
com.googlecode.snoopd.driver.Scheduler - starting Scheduler
com.googlecode.snoopd.core.Kernel - handle ScheduleUpdatedEvent with ActiveHandler
com.googlecode.snoopd.driver.Scheduler - synchronize scheduler with dev/9dbaaa52-8902-4cd7-89b7-1252a6a247ca
com.googlecode.snoopd.driver.Scheduler - updating scheduler
com.googlecode.snoopd.driver.Scheduler - set scheduler for node dev/9dbaaa52-8902-4cd7-89b7-1252a6a247ca
com.googlecode.snoopd.driver.Scheduler - set schedule for module 53abc066-f772-470d-bebf-d598231fccc3
com.googlecode.snoopd.driver.Scheduler - set schedule for module 0db484f3-9c9d-4423-87fe-a2e331d6fa66
com.googlecode.snoopd.driver.Scheduler - set schedule for module d2545757-0011-4fed-ad55-072526b09279
com.googlecode.snoopd.driver.Scheduler - set schedule for module 385425ef-ea5d-4c18-a9d1-1c84d701a3e
com.googlecode.snoopd.driver.Scheduler - set schedule for module 7edc819d-ab97-432b-8c87-8cc8e8686fca
com.googlecode.snoopd.core.Kernel - handle ScheduleLineComeEvent with ActiveHandler
com.googlecode.snoopd.core.Kernel - handle ScheduleLineComeEvent with ActiveHandler
com.googlecode.snoopd.core.Kernel - handle InvocationEvent with ActiveHandler
com.googlecode.snoopd.core.Kernel - handle InvocationEvent with ActiveHandler
com.googlecode.snoopd.core.Kernel - handle ResultRecievedEvent with ActiveHandler
com.googlecode.snoopd.driver.Resulter - storing result []
com.googlecode.snoopd.core.Kernel - handle ResultRecievedEvent with ActiveHandler
com.googlecode.snoopd.driver.Resulter - storing result []
```

Сообщения ядра в
стандартном потоке
вывода

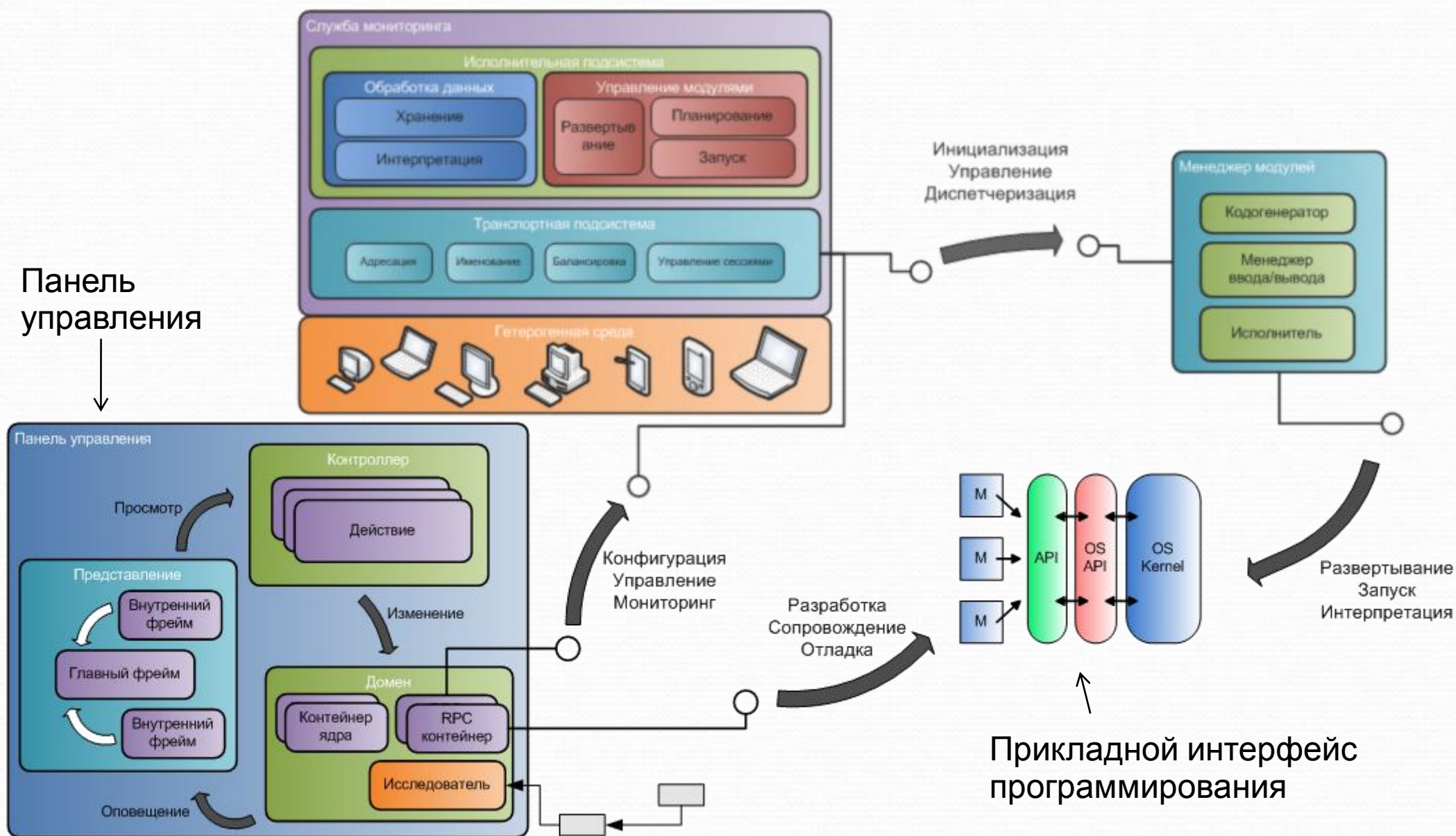
Недостатки файлов конфигурации



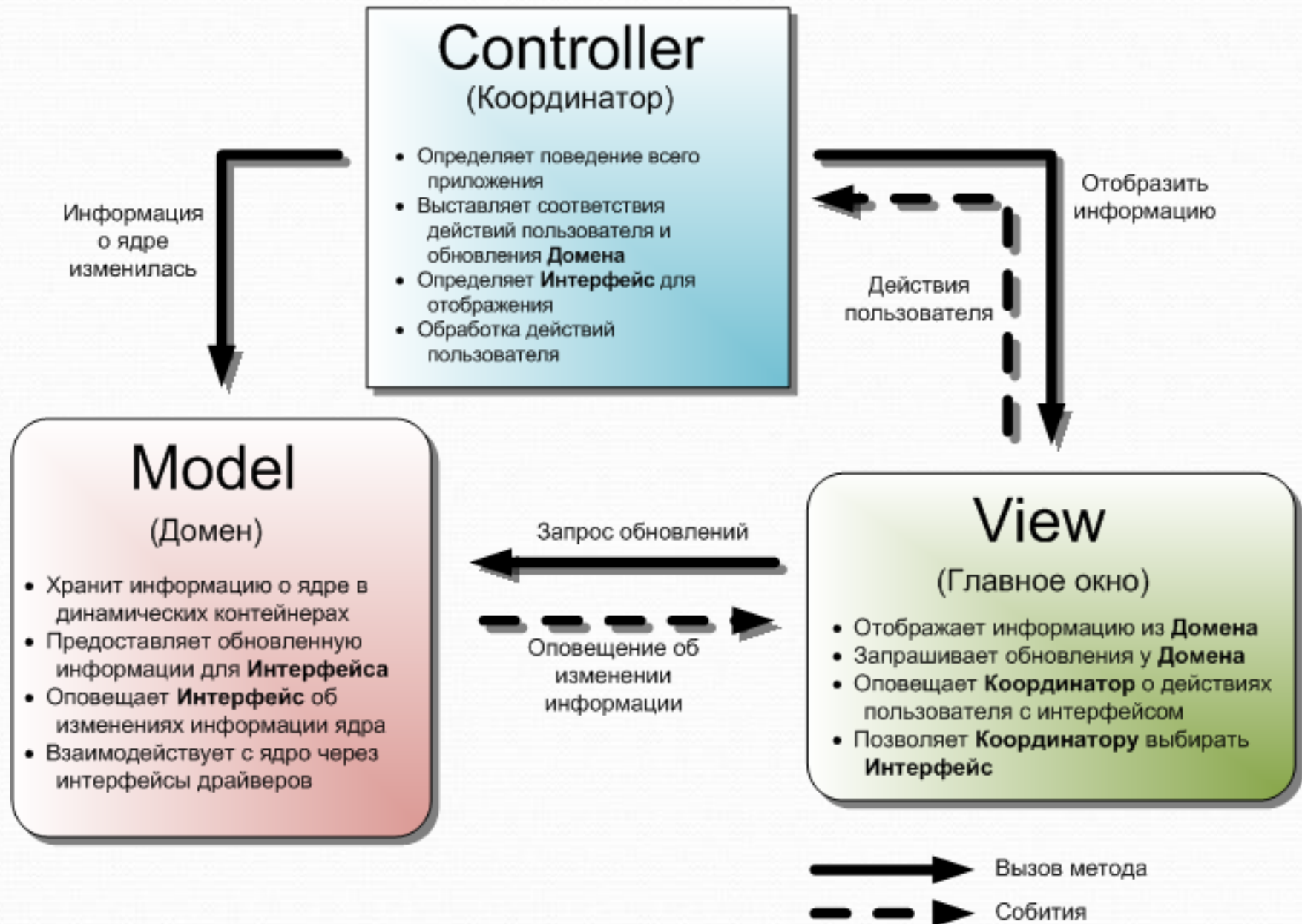
```
# /etc/fstab: static file system information.
#
# Use 'blkid -o value -s UUID' to print the universally unique identifier
# for a device; this may be used with UUID= as a more robust way to name
# devices that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options> <dump> <pass>
proc /proc proc nodev,noexec,nosuid 0 0
# / was on /dev/sda2 during installation
UUID=c3cd47c6-7347-427b-8121-f9f576623b11 / ext4 errors=remount-ro 0 1
# /home was on /dev/sda3 during installation
# Commented out by Dropbox
# UUID=2d8a139c-3fc6-4102-bc2d-ccbd6df6eb0f /home ext4 defaults 0 2
# swap was on /dev/sda1 during installation
UUID=6f942c32-35ed-4e0e-a616-6797e8946351 none swap sw 0 0
/dev/fd0 /media/floppy0 auto rw,user,noauto,exec,utf8 0 0
UUID=2d8a139c-3fc6-4102-bc2d-ccbd6df6eb0f /home ext4 defaults,user_xattr 0 2
```

- Децентрализованное внесение изменений в конфигурацию нескольких приложений
- Сложность внесения изменений в процессе работы приложений
- Сложность восприятия информации в таком виде
- Существует вероятность внесения ошибки или опечатки

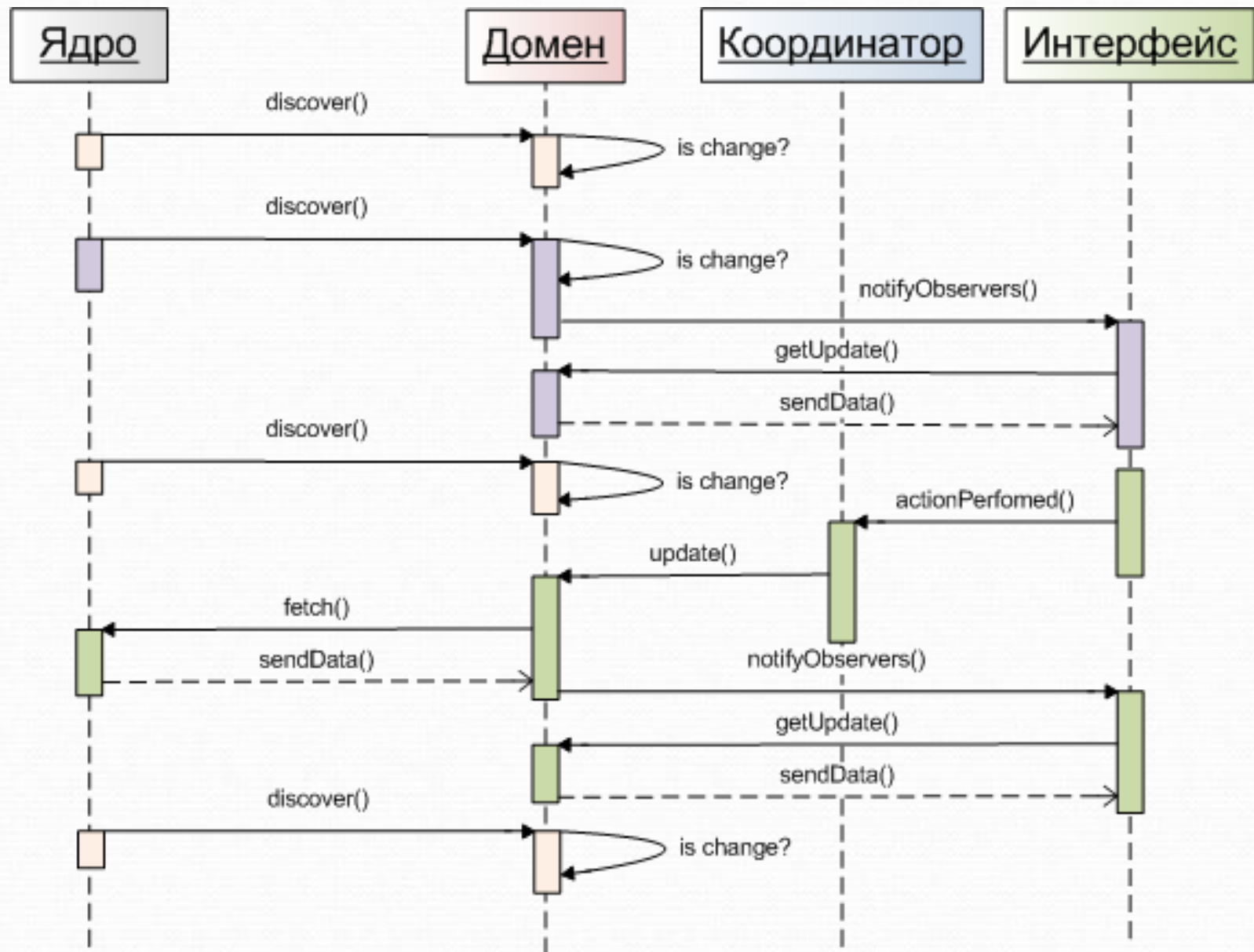
Структура проекта



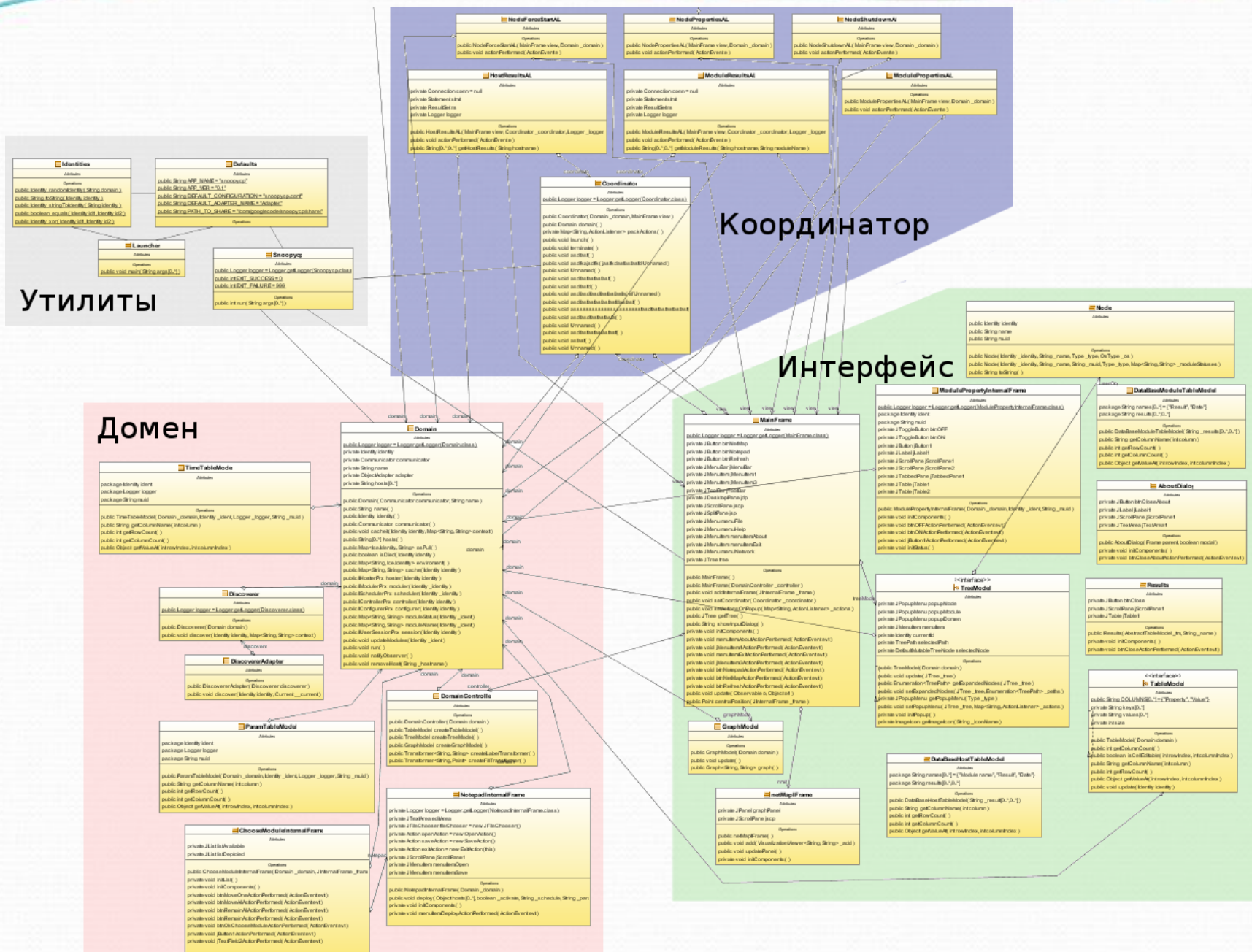
Модель приложения MVC



Функционирование и взаимодействие с ядром

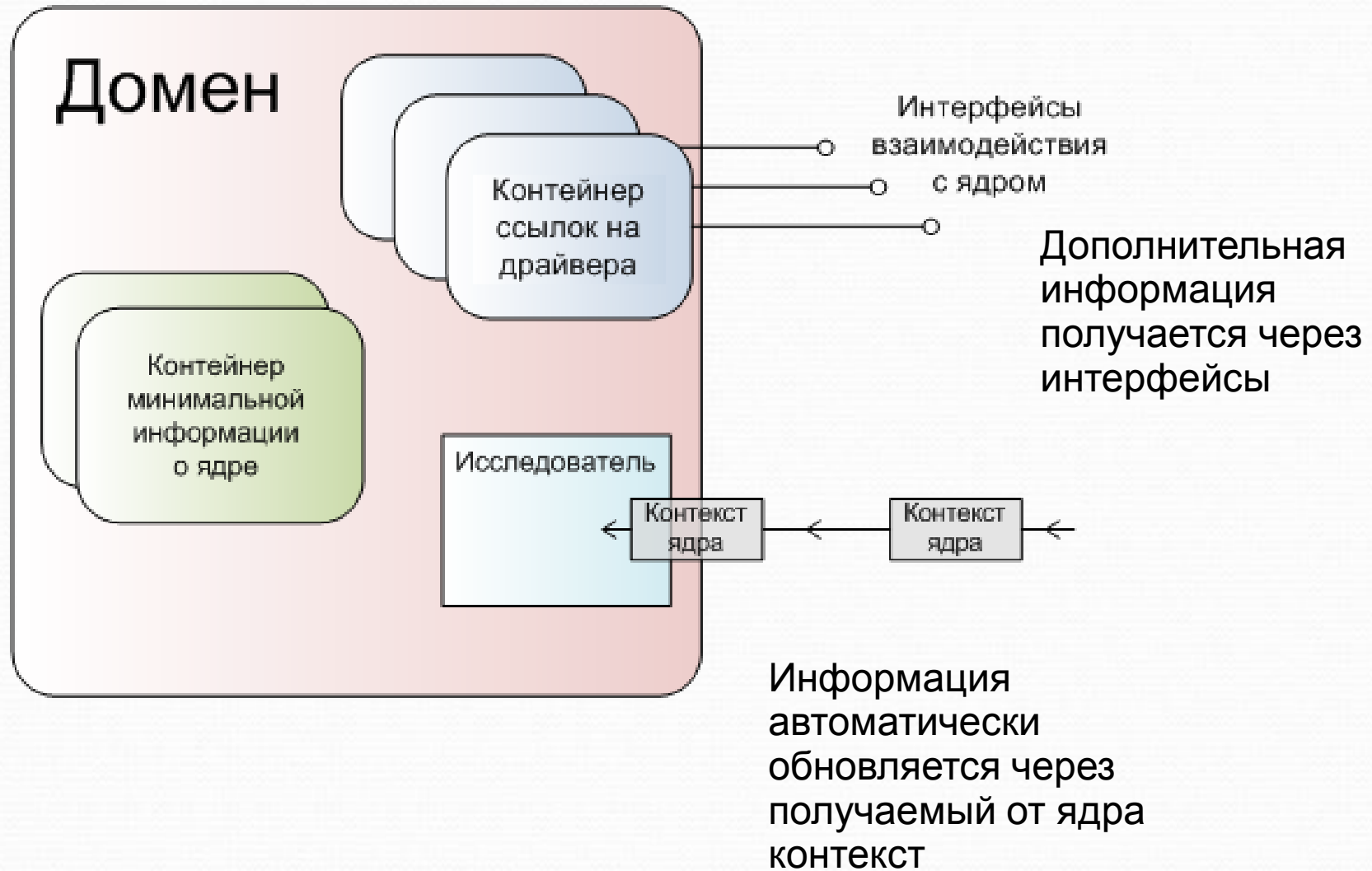


Архитектура приложения

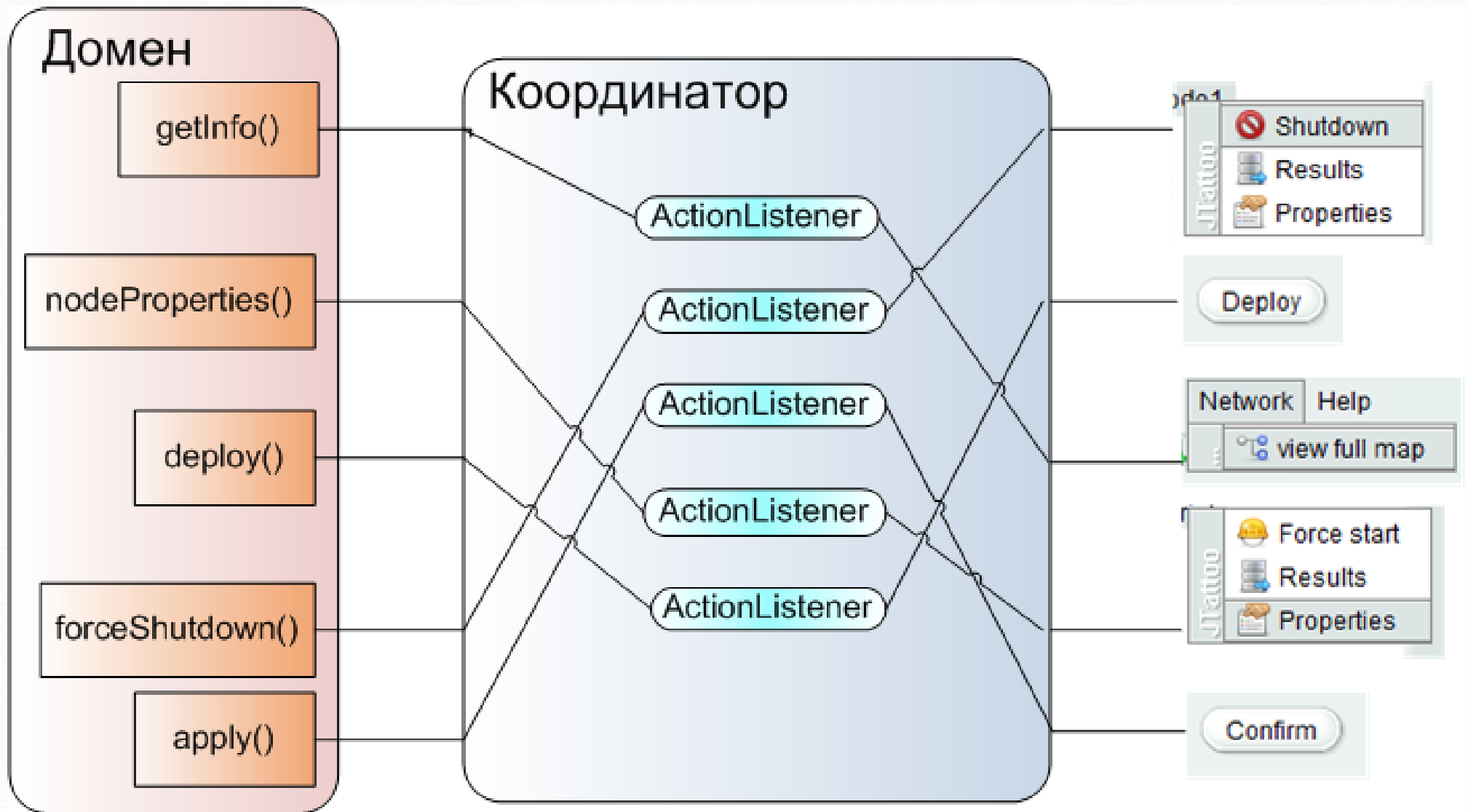


Хранение информации

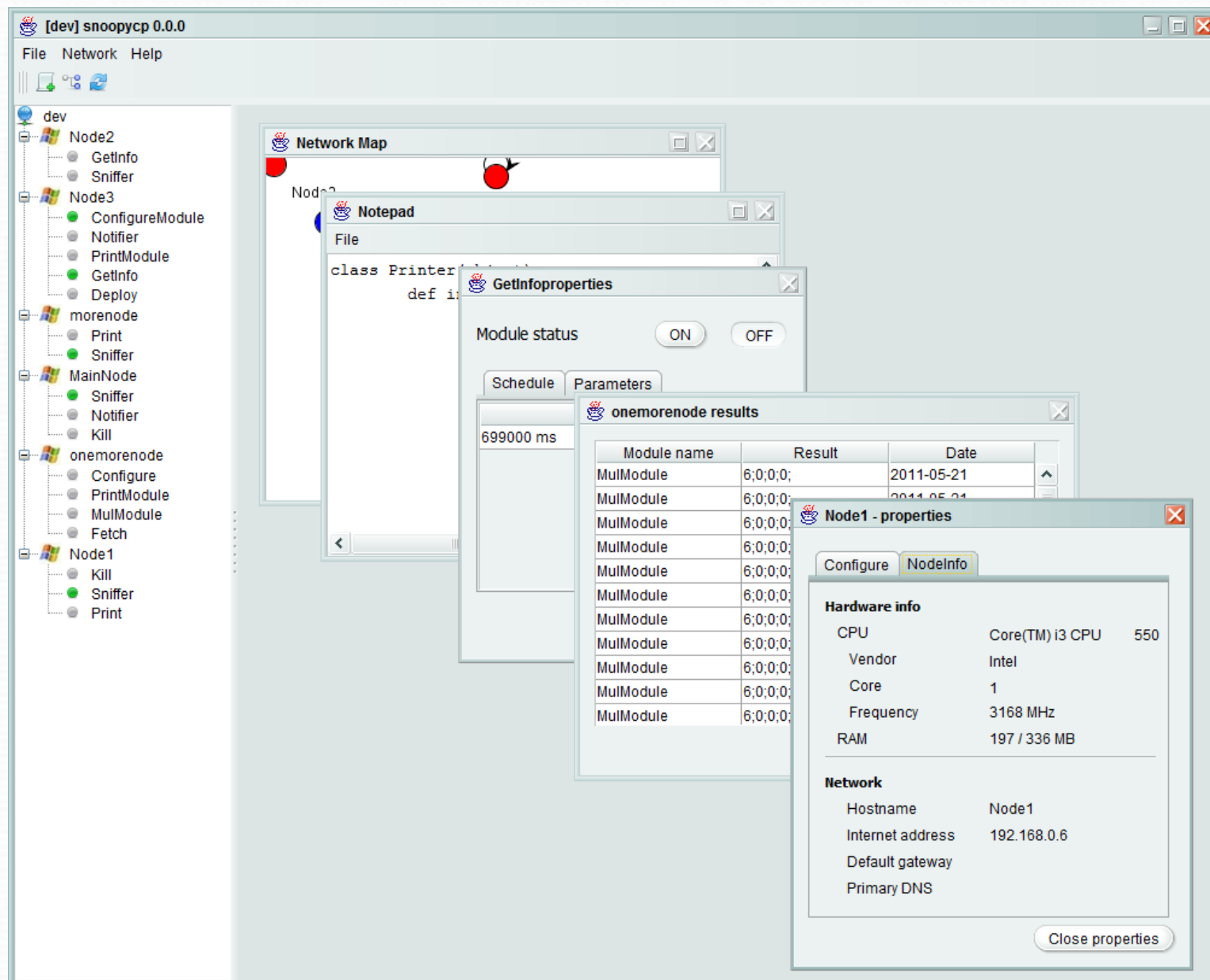
Постоянно
хранится только
минимальная
информация о
ядре



Взаимодействие компонентов



Визуализация



Использование API модулей

Интерфейс
API модулей

```
1 #  
2 # Snoopy Module example - matrix multiplication;  
3 #
```

```
4  
5 from Snoopy import Module
```

```
6  
7 class MatrixMultiplier(Module):
```

```
8  
9 def invoke(self, param):
```

```
10     A = param[0]
```

```
11     B = param[1]
```

```
12     C = mult(A, B)
```

```
13     return C
```

Входные
параметры

Выходные
параметры

Внутренний
метод модуля

```
14  
15 def mult(matrix1, matrix2):
```

```
16     if len(matrix1[0]) != len(matrix2):
```

```
17         print 'Matrices must be m*n and n*p to multiply!'
```

```
18     else:
```

```
19         new_matrix = zero(len(matrix1), len(matrix2[0]))
```

```
20         for i in range(len(matrix1)):
```

```
21             for j in range(len(matrix2[0])):
```

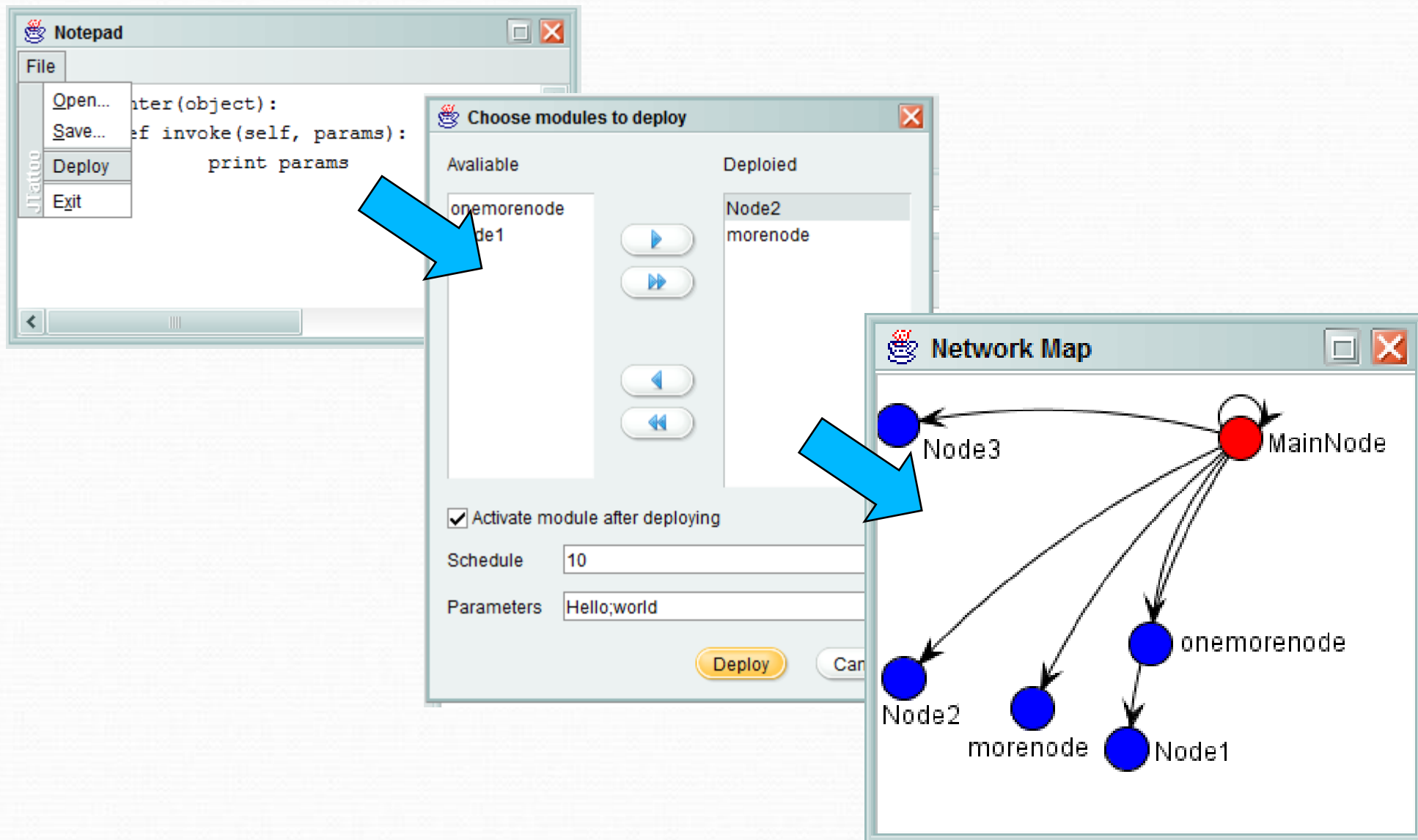
```
22                 for k in range(len(matrix2)):
```

```
23                     new_matrix[i][j] += matrix1[i][k]*matrix2[k][j]
```

```
24         return new_matrix
```

```
25
```


Развертывание модуля



Итоги

- **Проанализированы задачи** администратора систем и **построена модель** для визуализации данных и управления удаленными узлами
- **Разработана структура** системы визуализации и управления
- **Реализованные подсистемы** визуализации и управления включают:
 - ✓ Хранение информации о ядре
 - ✓ Визуализация информации и процессов
 - ✓ Координация взаимодействия компонентов
- **Разработан интерфейс** программирования модулей

Спасибо!
Вопросы?