

# MST

Автоматизация настройки мультисит-системы

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# 1970 год: Unix



Ken Thompson (sitting) and Dennis Ritchie (CC BY-SA 2.0)

# Современность



Мультисит-конфигурация  
2005 © Tiago Vignatti



«Build a Six-Headed, Six-User Linux System»  
© Bob Smith

# Проблематика

## Multiseat Configuration/Xephyr

< Multiseat Configuration  
(Redirected from Multiterminal with Xephyr)

Here, we are going to describe how to make a **Multiterminal with Xephyr**. There are already a lot of different ways to build [multiterminals](#) (also known as [multiseats](#)), and new ways are constantly being developed.

The way described here uses modifications on [Xephyr](#) that make possible to use it in order to implement a multiterminal system. The system is configured to run one [X](#) server controlling all video cards, and one Xephyr for each screen, running above the main X server, the same way as with Xnest.

While normal Xephyr receives events from its parent X server, modified Xephyr now is able to read the input devices events directly from kernel event interface.

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### Operating System required [\[ edit \]](#)

[Debian Etch](#) (but it's easy to adapt it to other linux distributions).

### Introduction [\[ edit \]](#)

Xephyr is an X server that runs inside another X server. Xephyr is both an X client and an X server, simultaneously. Xephyr is a client of the real X server, but also a server to its own clients. Xephyr is normally used to allow working on two or more desktops at the same time. However, we've made modifications to use Xephyr to implement a multiterminal system.

The system works in the following way. Only one «real» X server is run, configured to use several screens, each of which will be associated to one video card. After the X start-up, one Xephyr is run inside each screen. Each user will use one Xephyr, in a transparent way.

The original Xephyr gets the input devices events from its parent X server. However, to allow Xephyr to be used in the multiterminal, we had to modify its source code to make it read the events directly from kernel event interface, bypassing X. To read the mouse and keyboard events, the evdev protocol is used.

[https://en.wikibooks.org/wiki/Multiseat\\_Configuration/Xephyr](https://en.wikibooks.org/wiki/Multiseat_Configuration/Xephyr)

# Проблематика

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While normal Xephyr receives events from its parent X server, modified Xephyr now is able to read the input devices events directly from kernel event interface.

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[https://en.wikibooks.org/wiki/Multiseat\\_Configuration/Xephyr](https://en.wikibooks.org/wiki/Multiseat_Configuration/Xephyr)

# Сравнение с другими решениями

	<b>MST</b>	ОС Альт Мультисит и другие решения на базе X-сервера	Useful MultiSeat Linux™
Поддержка видеокарт с несколькими выходами	✓	✗	✓
Требуется доп. видеокарта	✗	✓	✗
Свободное ПО	✓	✓	✗

## Преимущества по сравнению с другими решениями

- Не требует специального оборудования
- Свободное ПО (распространяется под GPL v3+)  
[gitlab.com/gkaz/mst/](https://gitlab.com/gkaz/mst/)
- Можно задействовать интегрированную видеокарту
- Может быть развёрнута на ноутбуке
- Поддерживает аппаратное ускорение
- Работает на ОС Альт

# Участники проекта

- Слугин Владимир Георгиевич
- Попцов Артём Вячеславович
- Плеханов-Хоршев Антон Сергеевич
- Михаил Щербаков
- Специалисты ООО ГК «Азъ» и ГБПОУ «Нижегородский радиотехнический колледж»





# Компоненты системы

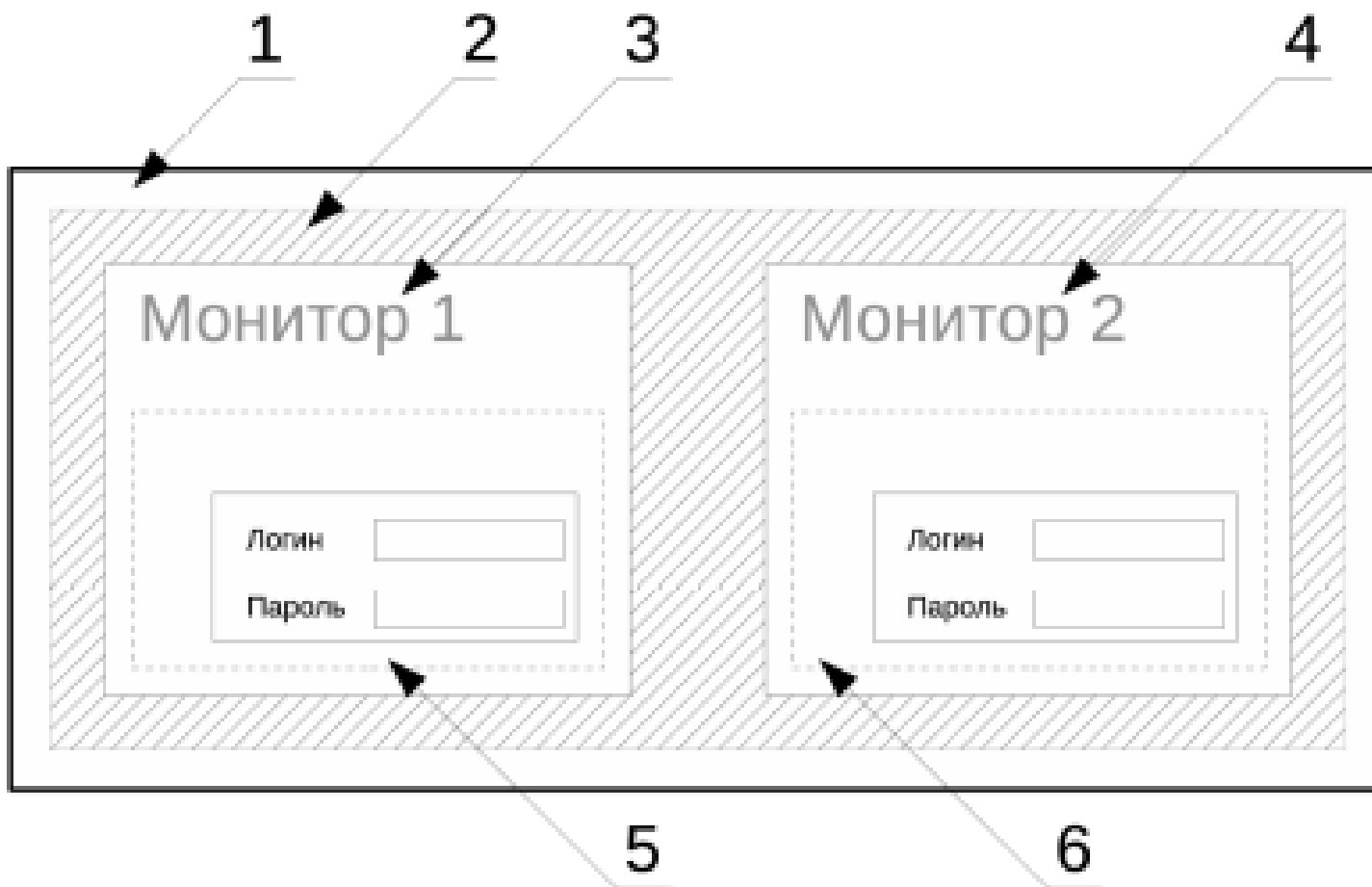
- Awesome
- Unclutter
- Xephyr
- LightDM
- Qt
- Udev
- VirgualGL



AWESOME

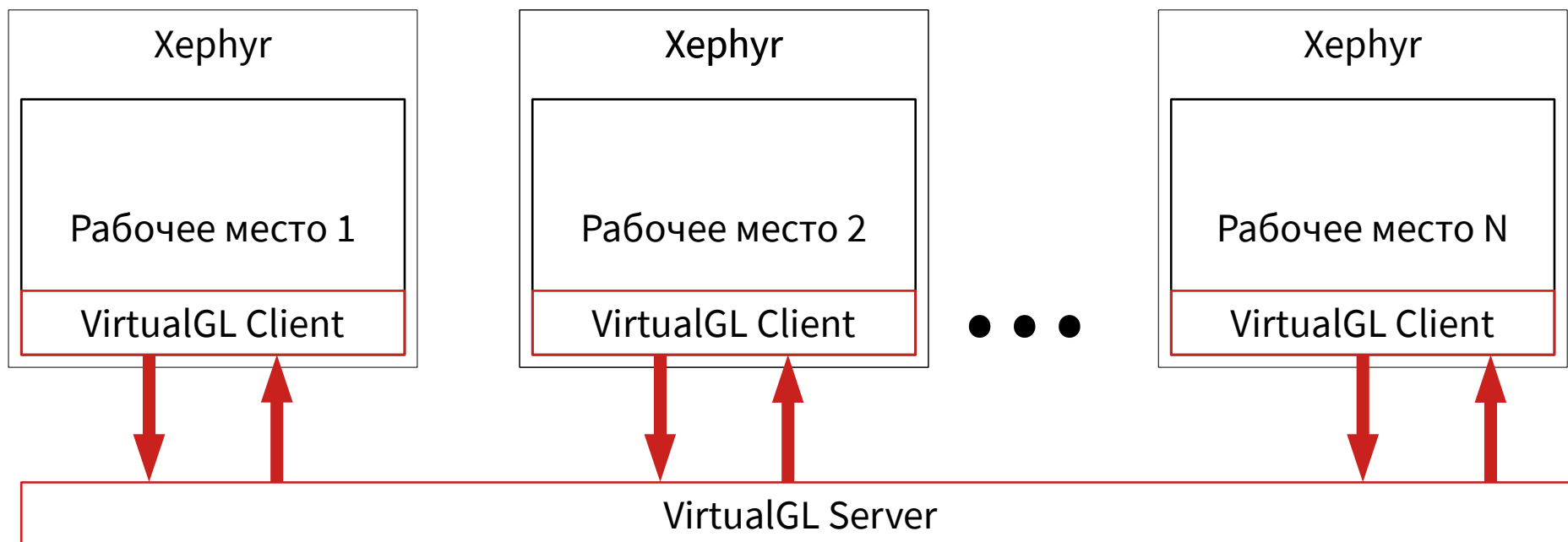
*Virtual*GL  
3D Without Boundaries

# Принцип работы



- 1: Основной X-сервер
- 2: Awesome WM
- 3, 4: Вложенный X-сервер
- 5, 6: LightDM

# Аппаратное 3D-ускорение



*VirtualGL*  
3D Without Boundaries

# Решённые проблемы

## USB-накопители:

- Привязка USB-разъёма к рабочему месту
- Автомонтирование в выделенный каталог
- *Скрипт для отмонтирования устройства*

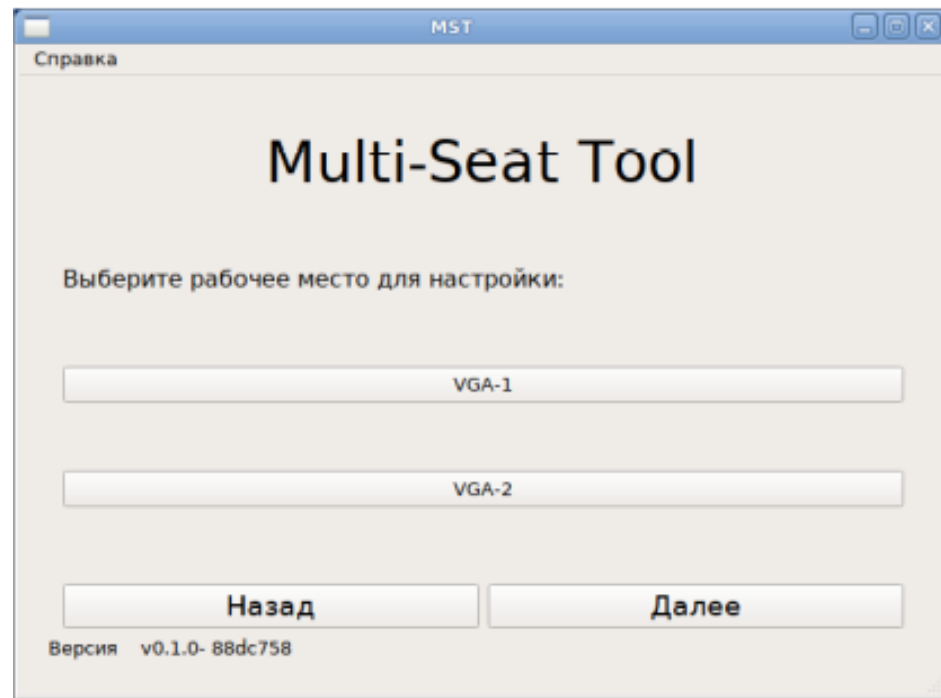
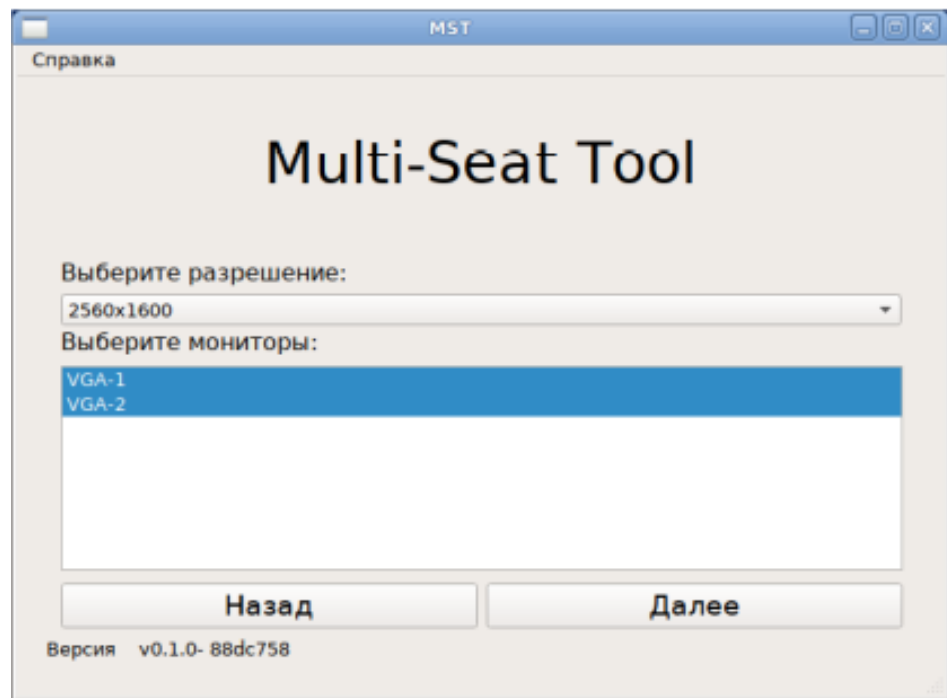
## Общие каталоги:

- Каталог с названием «ОБМЕН»
- Sticky bit

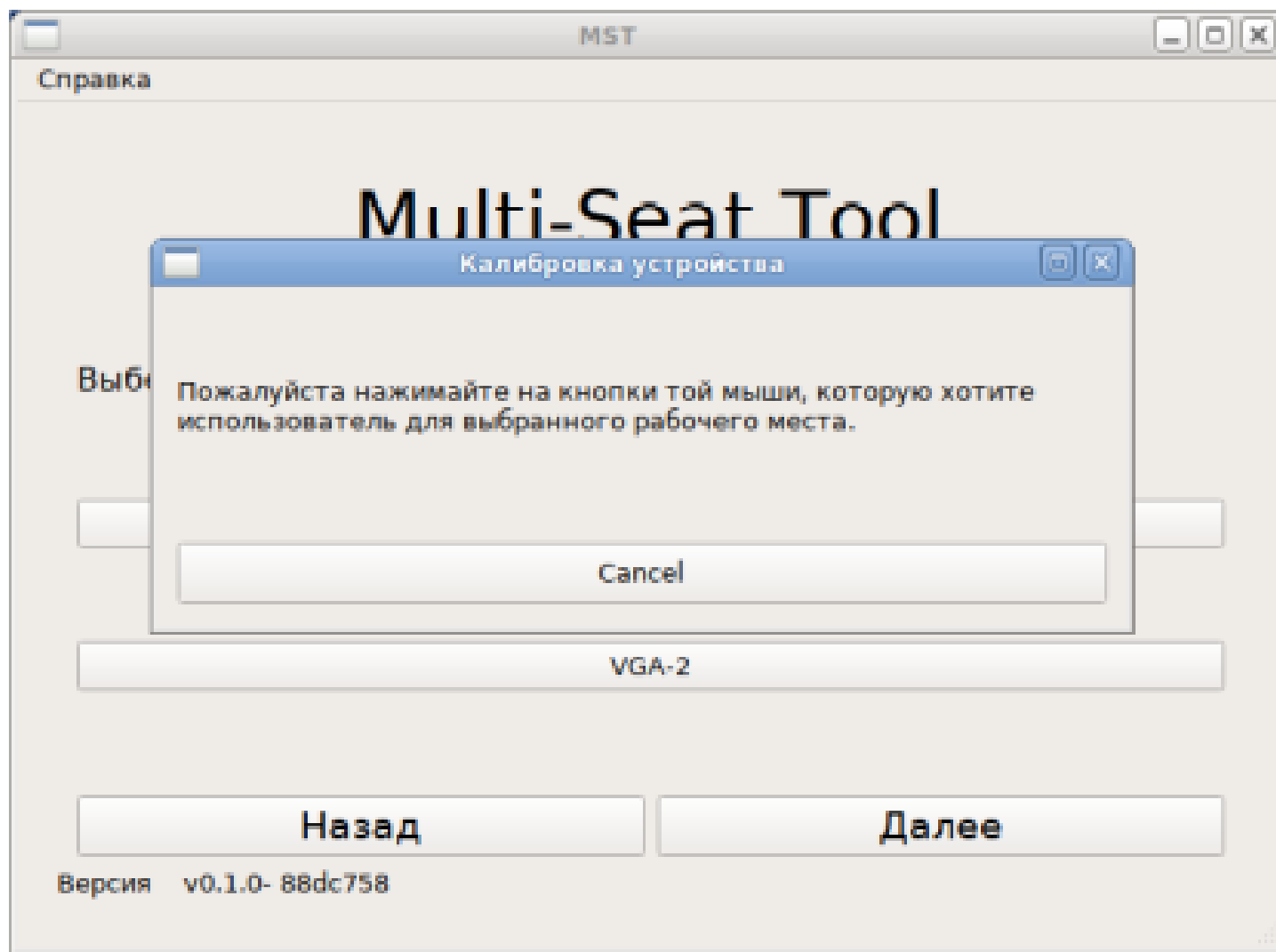
# Графический интерфейс



# Графический интерфейс



# Графический интерфейс



# Перспективы развития

- Добавление возможности создавать количество рабочих мест, большее или меньшее, чем количество мониторов.
- Портирование на другие дистрибутивы GNU/Linux.
- Внедрение проекта в образовательных организациях Нижегородской области.
- Внедрение проекта в образовательных организациях РФ.



# Спасибо за внимание

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GPG: D0C2 EAC1 3310 822D 98DE

B57C E9C5 A2D9 0898 A02F