

METHOD AND SYSTEM FOR DISTRIBUTION GUIDANCE BASED ON VIDEO AND VOICE

TECHNICAL FIELD

[0001] The present invention relates to the technical field of communication, specifically to a method and system for distribution guidance based on video and voice.

BACKGROUND

[0002] In an intelligent optical fiber distribution network, the optical fiber jumping process of a current distribution device is as follows: when jumping is needed, an intelligent management terminal (for example a smart phone, a mobile power supply, a communication protocol converter, etc.) is used to download a construction order from a network manager; the optical fiber distribution devices parse the order; a construction person finds the distribution device, sub-frame, panel and port to be jumped, walks to a distribution frame according to the prompts of the order on the optical fiber distribution device and then performs the jumping operations; after the jumping operation is completed, the intelligent management terminal returns a receipt to the network manager, and then the database is updated.

[0003] It can be seen that all operations are implemented with the participation of the intelligent management terminal and when the construction person does not carry the intelligent management terminal, the operations cannot proceed. Or, when the intelligent management terminal is abnormal, the construction effect will be greatly affected, for example an incorrect optical fiber jumping at the port finally causes adverse effects on the service quality which is transmitted through the optical fiber, so that the user gets a very bad service experience. In actual application, the following problems are generated during

the distribution process:

[0004] (1) The optical fiber distribution device indirectly communicates with the network manager and the intelligent management terminal performs communication and protocol conversion there-between, so that the information synchronization and consistency between the optical fiber distribution device and the network manager are constrained and limited by the intelligent management terminal.

[0005] (2) Common forms of the intelligent management terminal include smart phone, PDA (Personal Digital Assistant, usually called palmtop). With respect to a network manager, the screens are relatively small and the displayed information and content are limited, resulting in that the construction person gets a poor visual effect when checking the order.

[0006] (3) The intelligent management person usually does not give a voice prompt and notification on the downloading and parsing of the construction order, so that the construction person gets the information in an indirect way, and tends to make visual errors.

[0007] (4) The order parsing task is completed by the optical fiber distribution device, so that the optical fiber distribution device has the workload increased and needs to perform information interaction with the network manager so that the optical fiber distribution device tends to malfunction.

SUMMARY OF THE INVENTION

[0008] The technical problems to be solved by the present invention include failure in direct communication between the optical fiber distribution device and the network manager of the existing distribution guidance technology, limited information and content display and no voice prompt.

[0009] To solve the above technical problems, the present invention adopts the following technical solution. A system for distribution guidance based on video and voice includes a network manager and an optical fiber distribution device; the optical fiber distribution device directly communicates with the network manager through an SNMP;

[0010] the network manager parses a service order to obtain a construction order and assigns construction order tasks;

[0011] the optical fiber distribution device is provided with a control zone and a plurality of distribution zones in turn from the top down, each of distribution zones is configured for jumping distribution of the optical fibers and consists of optical fiber distribution panels, wherein the control zone includes a control unit, a video display unit and a voice play unit;

[0012] the control unit receives and manages the construction order tasks, drives and controls the video display unit and the voice play unit to synchronously perform real-time displaying and voice prompting on a port state and order content according to the construction order; and the control unit returns the operating results of an optical fiber jumping operation which is implemented on the optical fiber distribution panels according to the displayed content and a voice prompt to the network manager in the form of a receipt.

[0013] According to the system for distribution guidance based on video and voice, the network manager comprises a service order acquiring unit, an order parsing unit and an order assigning unit;

[0014] wherein the service order acquiring unit sends the acquired service order to the order parsing unit, the order parsing unit splits the service order into construction orders, converts the construction orders into order atom commands and sends the commands to the order assigning unit and the order assigning unit assigns the construction

orders to the corresponding optical fiber distribution device.

[0015] According to the system for distribution guidance based on video and voice, the order content includes order type, name/ID/frame number/panel number/port number of a device at the jumping operation terminal, name/ID/frame number/panel number/port number of a device at the jumping operation opposite terminal, jumping information of optical fibers, mark of a construction person and expected completion time.

[0016] According to the system for distribution guidance based on video and voice, the number of the optical fiber distribution panels is flexibly configured upon actual demands; each optical fiber distribution panel is provided with port indicator lights, and the port indicator lights turn up in turn according to the task sequence specified on the construction order to guide a user to ports to perform construction operations.

[0017] According to the system for distribution guidance based on video and voice, the control unit includes:

[0018] a communication and control module for acquiring and receiving port guide control information of the construction orders and configuring an atom command for each corresponding construction order, and returning the port state of the optical fiber distribution device and the handling results of the construction orders to the network manager;

[0019] a video drive module which converts the port state of the optical fiber distribution device and the order content of each construction order into corresponding video information and under the control by the communication and control module, drives the video display module to perform real-time displaying or to close the displaying of the port state of the optical fiber distribution device and the order content of each construction order;

[0020] a distribution guide module which converts the atom command of each

construction order into a port guide command and triggers flashing of the port indicator lights of each optical fiber distribution panel;

[0021] a voice drive module which converts the port state of the optical fiber distribution device and the order content of the construction order into corresponding voice information and drives the voice play unit to play the voice information;

[0022] a power module, supplying power to the communication and control module, the video drive module, the distribution guide module and the voice drive module.

[0023] According to the system for distribution guidance based on video and voice, the port indicator light states include:

[0024] off, which represents that the port does not receive any operations and display any alerts;

[0025] fast flashing, which represents that the port displays an alert;

[0026] normally on, which represents that the port waits for fiber jumping operations;

[0027] slow flashing, which represents that the port is opposite to the port which waits for the fiber jumping operations.

[0028] According to the system for distribution guidance based on video and voice, the video display unit is a multi-color display screen and each optical fiber port state is displayed corresponding to a display color.

[0029] According to the system for distribution guidance based on video and voice, the receipt content includes ID number, task completion situation, order type, name/ID/frame number/panel number/port number of a device at the jumping operation terminal, name/ID/frame number/panel number/port number of a device at the jumping operation opposite terminal.

[0030] According to the system for distribution guidance based on video and voice, the control unit reports the generated alerts to the network manager in real time in the process of implementing jumping operation on optical fibers according to the requirements as specified in the work order.

[0031] The present invention also provides a method for distribution guidance based on video and voice, including the following steps:

[0032] step: S100: parsing a service order to obtain a construction order and assigning construction order tasks through an SNMP by the network manager;

[0033] step: S200: receiving and managing the construction order tasks, and driving the video display unit and the voice play unit to synchronously perform real-time displaying and voice prompting on a port state and order content according to the construction order, by the optical fiber distribution device;

[0034] step: S300: performing an optical fiber jumping operation according to displayed content and a voice prompt, and returning an operation result to the network manager in the form of a receipt.

[0035] In the present invention, the network manager and the optical fiber distribution device communicate with each other through the SNMP; the construction order content parsed by the network manager is converted into the atom command which is easily identified and operated by the optical fiber distribution device, thereby not only reducing the workload and work difficulties for the optical fiber distribution device, avoiding malfunction of the optical fiber distribution device of the system caused by frequent interaction, but also enabling the optical fiber distribution device to directly acquire the information about the construction order from the network management and to return a receipt to the network manager, realizing real-time interaction between the optical fiber distribution device and the network manager, and ensuring the information

synchronization and consistency between the optical fiber distribution device and the network manager. At the same time, in the present invention, the optical fiber distribution device is configured with the video display unit and the voice play unit that synchronously displays and plays the prompts on optical fiber distribution and jumping, so that the construction person understands the port positioning information and the jumping prompts through visual and auditory senses, reducing the error rate and obtaining high timeliness.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] FIG.1 is a general block diagram of a system for distribution guidance based on video and voice provided by the present invention;

[0037] FIG.2 is a structural view of an optical fiber distribution device in the present invention;

[0038] FIG.3 is a structural view of a control unit in the present invention;

[0039] FIG.4 is a flowchart of a method for distribution guidance based on video and voice provided by the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0040] The present invention is described below in detail in conjunction with the attached drawings and embodiments.

[0041] As shown in FIG.1, the present invention provides a system for distribution guidance based on video and voice. The system includes a network manager 10 and an optical fiber distribution device 20. At a physical interface, the optical fiber distribution device 20 is connected to the network manager 10 through an active cable, and communication is implemented through an SNMP. The active cable in the present invention does not refer to a cable with a length of several meters, but generally refers to

all cables between the network manager 10 and the optical fiber distribution device 20. The network manager 10 and the optical fiber distribution device 20 transmit information to each other through the Internet, and a plurality of exchangers and routers are arranged there-between.

[0042] The network manager 10 as a management platform docked with an application directly manages the optical fiber distribution device, parses a service order to obtain a construction order and assigns construction order tasks. In the present invention, the network manager 10 may also be the network manager of transmitters (for example, SDH (Synchronous Digital Hierarchy), PDH (Plesiochronous Digital Hierarchy), wavelength division, OTN (Optical Transport Network) devices, etc.) or the network manager of access devices (for example, PCM, PON, SPC exchange, protocol converter, etc.).

[0043] The network manager 10 includes a service order acquiring unit, an order parsing unit and an order assigning unit.

[0044] The service order acquiring unit sends the acquired service order to the order parsing unit; the order parsing unit splits the service order into a construction orders, converts the construction orders into order atom commands and sends the commands to the order assigning unit; and the order assigning unit assigns the construction orders to the corresponding optical fiber distribution device.

[0045] The optical fiber distribution device 20 mainly completes the functions of optical fiber storage, jumping operation, etc., and also has functions of monitoring the port state and realizing distribution guidance based on videos and voices. The optical fiber distribution device performs visual displaying of the received order information, and is configured with voice prompts and alerts. The construction person performs the optical fiber jumping operation within a frame or between frames according to the demands of the

order, and transmits operation results and alerts to the network manager 10. As shown in FIG.2, the optical fiber distribution device 20 is provided with a control zone and a plurality of distribution zones in turn from the top down, wherein each of distribution zones is configured for jumping distribution of optical fibers and consists of optical fiber distribution panels 24 (the number of the optical fiber distribution panels 24 may be flexibly set upon actual demands). The control zone is a key distribution guidance zone of the optical fiber distribution device 20, including a control unit 21, a video display unit 22 and a voice play unit 23.

[0046] The control unit 21 communicates with the network manager 10, namely receiving and managing the construction order tasks, drives and controls the video display unit 22 and the voice play unit 23, and synchronously performs real-time displaying and voice prompting (the voice prompt is played while the content is displayed) on a port state and order content according to the construction order; and the control unit 21 returns the operation result of an optical fiber jumping operation which is carried out on the optical fiber distribution panels 24 according to displayed content and the voice prompt to the network manager 10 in the form of a receipt.

[0047] In the present invention, the video display unit 22 is usually a display screen to complete the visual displaying of order information. In order to facilitate communication with the control unit 21, the video display unit may be located at the upper part or middle-upper part of the optical fiber distribution device 20. In order to distinguish different optical fiber port states (for example, fiber plugging, fiber unplugging, alerting, etc.), the video display unit 22 in the present invention may also be a multi-color display screen, and each optical fiber port state is displayed corresponding to one display color. The multi-color display screen may be an LED (Light Emitting Diode), an LCD (Liquid Crystal Display), an OLED (Organic Light Emitting Diode), etc. The voice play unit 23

may be a loudspeaker of a size and type that is configured according to the frame space of the optical fiber distribution device 20 to complete the voice playing function of the order information.

[0048] In the present invention, as shown in FIG.3, the control unit 21 includes a communication and control module 211, a video drive module 212, a distribution guide module 213, a voice drive module 214 and a power module 215. The communication and control module 211 communicates with the network manager 10 through the SNMP (Simple Network Management Protocol), acquires and receives the port guidance control information (namely the information of the control port indicator lights, construction person, etc.) of the construction order, configures an atom command for the construction order (the atom command refers to a command which enables the optical fiber distribution device to perform operation automatically after receiving the command, for example operating the indicator light, so that the workload of the device, the time of interaction between the device and the network manager, and the device cost may be reduced), returns the port state of the optical fiber distribution device 20 and the handling result of the construction order to the network manager 10, and reports alerts to the network manager 10 in real time.

[0049] The video drive module 212 completes the information conversion and driving functions, converts the port state of the optical fiber distribution device 20 and the content of the construction order into corresponding video information (converts the original binary data code flow into video data flow), and under the control of the communication and control module 211, drives the video display module 22 to display and close the states of the frame, sub-frames, panels, ports, etc. of the optical fiber distribution device 20 and the content of the construction order (order content) and close the same in real time, so that the construction person acquires information in use.

[0050] The distribution guide module 213 which converts the atom command of the construction order into a port guide command, and triggers flashing of the port indicator lights of the optical fiber distribution panels 24. The port indicator light states include:

[0051] off, which represents that the port does not receive any operations and display any alerts;

[0052] fast flashing, which represents that the port displays an alert;

[0053] normally on, which represents that the port waits for fiber jumping operations (for example plug-in or plug-out of the optical fibers);

[0054] slow flashing, which represents that the port is opposite to the port which waits for the fiber jumping operations.

[0055] The voice drive module 214 converts the port state of the optical fiber distribution device 20 and the content of each construction order into corresponding voice information, and drives the voice play unit 23 to play voice prompts (to play voice information) in coordination with the content displayed by the video display unit 22, thus bringing convenience to the construction person and helping the construction person to complete the construction order tasks.

[0056] The power module 215 supplies power to the communication and control module 211, the video drive module 212, the distribution guide module 213 and the voice drive module 214.

[0057] The present invention also provides a method for distribution guidance based on video and voice, as shown in FIG.4, including the following steps.

[0058] Step S100: Parse a service order to obtain a construction order and assigning construction order tasks through an SNMP by a network manager.

[0059] It can be seen that, in the present invention, the optical fiber distribution

device and the network manager communicate with each other through the SNMP. The SNMP version is recommended to be SNMPv2c. On the network manager side, the manager role in the SNMP is adopted, namely serving as a manager to use the workstation. On the optical fiber distribution device side, the agent role in the SNMP is adopted, namely realizing the agent function.

[0060] In the present invention, step S100 specifically includes the following steps:

[0061] Step S101: The network manager acquires the service order. The acquisition way is as follows: the service order is acquired automatically from an upper order system or the service order is manually input. Web service, TL1 (Transaction Language -1), etc. are usually adopted as the acquisition interface protocol.

[0062] Step S102: The network manager automatically splits the service order into the construction order, and assigns the construction person for the construction order.

[0063] Step S103: The network manager parses the construction order, converts the construction order into order atom commands, and assigns the electronic construction order to the corresponding optical fiber distribution device.

[0064] In the present invention, the order content of the construction order includes order type (newly installed, dismantled or changed), name/ID/frame number/panel number/port number of a device at the jumping operation terminal, name/ID/frame number/panel number/port number of a device at the jumping operation opposite terminal, jumping information of optical fibers, mark of the construction person and expected completion time.

[0065] Step S200: The optical fiber distribution device receives and manages the construction order tasks, drives the video display unit and the voice play unit to synchronously perform real-time displaying and voice prompting on a port state and order

content according to the construct. The video display unit displays the port state and order content and implements closing operations through the display screen. The voice play unit plays the port state and order content through the loudspeaker.

[0066] In the present invention, the construction orders received by the optical fiber distribution device first are assigned into a service panel frame, and then the service panel frame distributes the service orders to a service panel in the service panel frame for handling. After receiving the orders sent by the network manager, the optical fiber distribution device triggers the order guide light on the frame to light on, reminding the user that construction operation can be implemented, and drives the display screen and the loudspeaker to respectively display the state of the port where the operation is implemented and give the voice prompt in real time.

[0067] Step S300: Perform an optical fiber jumping operation according to displayed content and the voice prompt, and report an operation result and an operation alert to the network manager in the form of a receipt.

[0068] The field construction person performs jumping operations on the optical fibers (for example, jumping fiber, pigtail, pigtail of the optical branching device) according to the content displayed on the display screen, the voice prompt given by the loudspeaker and the lit conditions of the port indicator lights, for example single-end jumping connection, jumping connection within the frame, jumping connection among the frames, batch jumping connection, etc. After completing the jumping operation on the optical fibers, the field construction person returns the construction result to the network manager, and reports errors, for example abnormal plug-in or plug-out of the optical fibers at the port, abnormal plug-in or plug-out of the service panel, that occur during the construction process, to the network manager in real time.

[0069] The receipt content includes ID number of the order, task completion

situation, order type (newly installed, dismantled or changed), name/ID/frame number/panel number/port number of a device at the jumping operation terminal, name/ID/frame number/panel number/port number of a device at the jumping operation opposite terminal, etc. The jumping operation terminal and the jumping operation opposite terminal may be located at the same optical fiber distribution device or at different optical fiber distribution devices.

[0070] In the present invention, when uniformly assigning a plurality of order tasks to the optical fiber distribution device, the network manager completes the current order, returns a receipt, and then continues to handle the next order task until all order tasks are completed. Then, the flow ends normally.

[0071] Obviously, those skilled in this field can make various changes and modifications on the present invention on the basis of the concept and scope of the present invention. Thus, when those changes and modifications shall fall within the protective scope of the present invention, the present invention should also tend to include those changes and modifications.

What is claimed is:

1. A system for distribution guidance based on video and voice, comprising a network manager and an optical fiber distribution device, characterized in that the optical fiber distribution device directly communicates with the network manager through an SNMP;

the network manager parses a service order to obtain a construction order and assigns construction order tasks;

the optical fiber distribution device is provided with a control zone and a plurality of distribution zones in turn from the top down; each of distribution zones is configured for jumping distribution of optical fibers and consists of optical fiber distribution panels, wherein the control zone includes a control unit, a video display unit and a voice play unit;

the control unit receives and manages the construction order tasks, drives and controls the video display unit and the voice play unit to synchronously perform real-time displaying and voice prompting on a port state and order content according to the construction order; and the control unit returns the operating results of an optical fiber jumping operation which is implemented on the optical fiber distribution panels according to displayed content and a voice prompt to the network manager in the form of a receipt.

2. The system for distribution guidance based on video and voice according to claim 1, characterized in that the network manager comprises a service order acquiring unit, an order parsing unit and an order assigning unit;

wherein the service order acquiring unit sends the acquired service order to the order parsing unit, the order parsing unit splits the service order into construction orders, converts the construction orders into order atom commands and sends the commands to the order assigning unit, and the order assigning unit assigns the construction orders to the corresponding optical fiber distribution device.

3. The system for distribution guidance based on video and voice according to claim 1,

characterized in that the order content includes order type, name/ID/frame number/panel number/port number of a device at the jumping operation terminal, name/ID/frame number/panel number/port number of a device at the jumping operation opposite terminal, jumping information of optical fibers, mark of a construction person and expected completion time.

4. The system for distribution guidance based on video and voice according to claim 1, characterized in that the number of the optical fiber distribution panels is flexibly configured upon actual demands; each of the optical fiber distribution panels is provided with port indicator lights, and the port indicator lights turn up in turn according to the task sequence specified on each corresponding construction order to guide a user to a port where construction operation is implemented.

5. The system for distribution guidance based on video and voice according to claim 4, characterized in that the control unit comprises:

a communication and control module for acquiring and receiving port guide control information of the construction orders and configuring an atom command for each corresponding construction order and returning the port state of the optical fiber distribution device and the handling results of the construction orders to the network manager;

a video drive module which converts the port state of the optical fiber distribution device and the order content of each construction order into corresponding video information and under the control by the communication and control module, drives the video display module to perform real-time displaying or to close the displaying of the port state of the optical fiber distribution device and the order content of each construction order;

a distribution guide module which converts the atom command of each construction

order into a port guide command, and triggers flashing of the port indicator lights of each optical fiber distribution panel;

a voice drive module which converts the port state of the optical fiber distribution device and the order content of the construction order into corresponding voice information, and drives the voice play unit to play the voice information;

a power module, supplying power to the communication and control module, the video drive module, the distribution guide module and the voice drive module.

6. The system for distribution guidance based on video and voice according to claim 5, characterized in that the port indicator light states include:

off, which represents that the port does not receive any operations or display any alerts;

fast flashing, which represents that the port displays an alert;

normally on, which represents that the port waits for the fiber jumping operations;

slow flashing, which represents that the port is opposite to the port which waits for the fiber jumping operations.

7. The system for distribution guidance based on video and voice according to claim 1, characterized in that the video display unit is a multi-color display screen and each optical fiber port state is displayed corresponding to a display color.

8. The system for distribution guidance based on video and voice according to claim 1, characterized in that the receipt content includes ID number, task completion situation, order type, name/ID/frame number/panel number/port number of a device at the jumping operation terminal, name/ID/frame number/panel number/port number of a device at the jumping operation opposite terminal.

9. The system for distribution guidance based on video and voice according to any one of claims 1-8, characterized in that the control unit reports the generated alerts to the

network manager in real time in the process of implementing jumping operations on optical fibers according to the requirements as specified in the work order.

10. A method for distribution guidance based on video and voice, characterized by comprising the following steps:

step: S100: parsing a service order to obtain a construction order and assigning construction order tasks through an SNMP by the network manager;

step: S200: receiving and managing the construction order tasks, and driving the video display unit and the voice play unit to synchronously perform real-time displaying and voice prompting on a port state and order content according to the construction order, by the optical fiber distribution device;

step: S300: performing an optical fiber jumping operation according to displayed content and a voice prompt, and returning an operation result to the network manager in the form of a receipt.