CLAIMS

1. A method for controlling transfer of print data (480) from clients (110) connected in a network (100) to shared printing devices (130, 130a) connected in the network, the method comprises the steps of:

providing (S1) print data (480) upon reception of a request to print to a printing device connected in the network,

forming (S2) header information (470) for the print data based on information provided by a configurable logic means (125a, 125b, 125c), wherein said header information (470) comprises information (471) related to at least one designated printing device controller (140) identified based on the request to print to a printing device,

processing (S3) the print data (480) so as to provide processed print data (400) comprising the formed header information (470),

sending (S4) the processed print data (400) to the at least one designated printing device controller (140),

receiving (S5) the processed print data (400) at the designated printing device controller (140),

reading (S6) at the designated printing device controller (140) the header information (470) of the received processed print data (400) and

controlling (S7) the processed print data in accordance with the header information, said controlling comprises

forming (S8) reconstructed print data from the processed print data at a destination printing device controller based on the header information, and

providing (S9) the reconstructed print data to the printing device.

2. A method for controlling transfer of print data according to claim 1, wherein

the step of forming (S2) the header information further comprises adding routing type information to the header information, wherein the routing type

information is provided from the configurable logic means comprising settings for a plurality of routing type options.

3. A method for controlling transfer of print data according to claim 2, wherein the plurality of routing type options comprises a direct transfer option, in which option the destination printing device controller is the designated printing device controller and in which option printing is performed at that printing device to which the designated printing device controller is associated.

4. A method for controlling transfer of print data according to claim 3, wherein the direct transfer option is set in the configurable logic means,

the step of forming (S8) the reconstructed print data is performed at the designated printing device controller, and

the step of providing (S9) the reconstructed print data to the printing device comprises providing the reconstructed print data to that printing device to which the designated printing device controller is associated.

5. A method for controlling transfer of print data according to any of the claims 2 - 4, wherein the plurality of routing type options comprises indirect transfer via the designated printing device controller.

6. A method according to claim 5, wherein the indirect transfer is performed via the designated printing device controller to the destination printing device controller.

7. A method according to claim 5 or 6, wherein the indirect transfer is performed from the designated printing device or destination printing device to a printing device for printing.

8. A method for controlling transfer of print data according to any of the claims 5 – 7, wherein the indirect transfer is set in the configurable logic means,

the step of forming (S8) the reconstructed print data is performed at the designated or destination printing device controller, and

the step of providing (S9) the reconstructed print data to the printing device comprises transferring the reconstructed print data to the printing device, wherein the printing device is controlled by the designated or destination printing device controller.

9. A method for controlling transfer of print data according to claim 7 or 8, wherein the step of processing (S3) the print data further comprises adding information related to the printing device to the print data and wherein the transfer to the printing device is performed based on this information.

10. A method for controlling transfer of print data according to claim 6, wherein the step of processing (S3) the print data further comprises adding information related to the destination printing device controller to the print data and wherein the transfer is performed based on this information.

11. A method for controlling transfer of print data according to any of the claims 2 - 10, wherein the plurality of routing type options comprises spawn.

12. A method for controlling transfer of print data according to claim 11, wherein the spawn option is set in the configurable logic means, and wherein

a spawning step (S75) comprises transmitting the processed print data to a group of printing device controllers comprising the designated printing device controller, and

the step of providing (S9) the reconstructed print data to the printing device comprises providing the reconstructed print data to the printing device based on a printing device user selection made after sending from the client.

13. A method for controlling transfer of print data according to claim 12, wherein the step of processing (S3) the print data further comprises adding information identifying the printing device controllers of the group of printing device controllers.

14. A method for controlling transfer of print data according to claim 12 or 13, wherein the print data is transmitted to the controllers of the group of printing device controllers using peer-to-peer technology.

15. A method for controlling transfer of print data according to any of the claims 2 - 14, wherein the print data is transmitted to the controllers of the group of printing device controllers for use in conjunction with pull printing.

16. A method according to any of the claims 1 – 15, wherein the forming (S2) of the header information (470) comprises including information (471) identifying a plurality of printing device controllers (140) and wherein the sending (S4) of the processed print data (400) to the designated printing device controller (140) is performed using multicast or broadcast transmission.

17. A method for controlling transfer of print data according to any of the preceding claims, wherein

the step of processing (S3) the print data further comprises compressing and/or encoding the print data and

the step of forming (S8) the reconstructed print data comprises performing decompression and/or decoding.

18. A method according to any of the preceding claims, further comprising a step of performing (S15, S85) print spooling on the print data.

19. A method according to claim 18, wherein the step of performing (S15) print spooling is performed before sending from the client to the printing device.

20. A method according to claim 18 or 19, wherein the step of performing (S85) print spooling is performed at the designated or destination printing device controller.

21. A method according to any of the claims 18-20, wherein a step of performing (S85) print spooling is performed in conjunction with pull printing.

22. A method according to any of the preceding claims, wherein the configurable logic units in the network transfer updated network controller information between them so that all the configurable logic units are updated with relevant network controller information.

23. Software for executing the steps of the method according to any of the claims 1-22.

24. A client controller arrangement (170) for controlling transfer of print data (480) from a client (110) connected in a network (100) to one of a plurality of printing devices (130, 130a) connected in the network, the client controller arrangement (170) comprising a client controller (120) and having access to configurable logic means (125a, 125b, 125c),

wherein the client controller (120) is arranged to

receive print data from the client (110) upon a request to print to a printing device (130, 130a) in the network,

form header information (470) for the print data (480) based on information in the configurable logic means (125a, 125b, 125c), wherein the header information (470) comprises information related to at least one designated printing device controller (140) identified based on the printing device (130, 130a) and

processing the print data (480) so as to provide processed print data (400) comprising the formed header information (470) and

sending the processed print data (400) to the at least one designated printing device controller (140).

25. A client controller arrangement (170) according to claim 24, wherein the configurable logic means are arranged to store settings identifying one printing device controller associated to each of a plurality of the printing devices of the network.

26. A client controller arrangement (170) according to claim 24 or 25, wherein the configurable logic means comprise settings for a plurality of routing type options, wherein the client controller is arranged to process the print data so as to add routing type information to the print data based on the settings of the configurable logic means (125a, 125b, 125c).

27. A client controller arrangement according to claim 26, wherein the configurable logic means (125a, 125b, 125c) comprise settings for at least two of the following routing type options:

- a direct transfer option, wherein printing is performed at that printing device to which the designated printing device controller is associated,
- an option for indirect transfer via the designated printing device controller, and
- spawn.

28. A client controller arrangement (170) according to claim 27, wherein the option for indirect transfer comprises the following two combinable options:

- an option for indirect transfer to a destination printing device controller, and
- an option for indirect transfer to the printing device.

29. A client controller arrangement (170) according to any of the claims claim 27-28, wherein the configurable logic means (125a, 125b, 125c) comprises settings identifying at least one group of printing device controllers associated to the respective designated printing device controller for use in the spawn routing type option.

30. A client controller arrangement (170) according to claim 27, wherein the client controller (140) is arranged to form the header information (470) for the print data based on the information identifying the controllers of the at least one group of printing device controllers.

31. A client controller arrangement (170) according to any of the claims 24 - 30, wherein the configurable logic means (125a, 125b, 125c) comprise settings for compression and/or encoding of the print data and the client controller is arranged to form the header information (470) for the print data based on the settings for compression and/or encoding of the print data stored in the configurable logic means (125a, 125b, 125c) and to compress and/or encode the print data in accordance with the settings stored in the configurable logic means (125a, 125b, 125c).

32. A client controller arrangement (170) according to any of the claims 24-31, further comprising a print spooling subsystem (190) arranged to perform print spooling on the print data.

33. A client controller arrangement (170) according to any of the claims 24-32, further comprising the client (110) arranged to provide the print data upon a request to print to a printing device in the network.

34. A printer arrangement (160) for a network (100) comprising clients (110) and printing devices (130, 130a), said printer arrangement (160) comprising a printing device controller (140) and a printing device (130) hosting the printing device

controller (140), wherein the printing device controller (140) is arranged to receive processed print data (400) comprising header information (470), read the header information (470) of the processed print data and control the processed print data in accordance with the header information, wherein the control of the processed print data comprises

reconstructing the processed print data to a format readable by the printing devices based on the header information and providing the reconstructed print data to the printing device (130, 130a) or another printing device controller (140) based on the header information (470) or

transmitting the processed print data (400) to at least one other printing device controller (140) based on the header information.

35. A printer arrangement (160) according to claim 34, wherein the printer arrangement is a multifunctional printing device.

36. A printer arrangement (160) according to claim 34, wherein the printer arrangement is a printer.

37. A printer arrangement (160) according to claim 34, wherein the printer arrangement is a network printer.

38. A printer arrangement according to any of the claims 34-37, further having access to configurable logic means (125a, 125b, 125c).

39. A printer arrangement according to claim 38, wherein the printing device controller (140) is arranged to reconstruct the processed print data to a format readable by the printing devices based on information in the configurable logic means (125a, 125b, 125c).

40. A printer arrangement according to claim 38 or 39, wherein the configurable logic means comprises a configurable logic unit (125c) arranged in the printer

arrangement, said configurable logic unit being arranged to exchange information with at least one configurable logic unit (125c) of another printer arrangement (160) and/or at least one client configurable logic unit (125a) and/or at least one network configurable unit (125b) so as to have access to updated network control information.

41. A printer arrangement according to any of the claims 34-40, further comprising a print spooling subsystem (180) arranged to perform print spooling.

42. A network (100) comprising at least one client arrangement (170) according to any of the claims 24 – 33.

43. A network (100) according to claim 42, further comprising at least one printer arrangement controller according to any of the claims 34-41.

44. A network (100) comprising at least one printer arrangement according to any of the claims 34-41.

45. A network comprising a plurality of clients, a plurality of printing arrangements and means for controlling the network, ***characterized in that*** the printing arrangements comprise printing device controllers each hosted by one associated printing device and that the means for controlling the network comprises at least one client configurable logic unit (125a) associated to each client and/or at least one network configurable logic unit (125b) forming a node in the network and/or at least one printer configurable logic unit (125c) associated to each printing arrangement, wherein the configurable logic units are arranged to provide network control information and wherein information is exchanged between the configurable logic units so that all configurable logic units have access to updated information.

46. A network according to claim 45, wherein the respective printer configurable logic unit (125c) is associated to the corresponding printing device controller.

47. A network according to claim 45 or 46, wherein the network control information comprises information for coordination of transfer of print data.

48. A network according to any of the claims 45 - 47, wherein the network control information comprises automatic re-routing rules.

49. A network according to any of the claims 45 - 48, wherein the network control information comprises encryption keys.

50. A network according to any of the claims 45 - 49, wherein the network information comprises information originating from a configurable logic unit of a plurality of client configurable logic units (125a) in the network.

51. A network according to any of the claims 45 - 50, wherein the network control information comprises defined groups of controllers for spawn functions.